Comparative Population Studies
Vol. 51 (2026): 125-150 (Date of release: 18.05.2026)

Changes in Living Arrangements of Young Spanish Adults Over Time

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Abstract: The process of transitioning into adulthood is changing due to shifts in norms and cultural beliefs, increasing individualisation, as well as changes in structural factors such as economic climate or educational patterns. This study examines how educational attainment and labour status influence recent changes in the residential situation of young adults in Spain. We adapt a semi-parametric decomposition technique for a categorical variable and a temporal relative decomposition approach. Results show that observed characteristics alone cannot fully explain the changes in youth living arrangements. The effects of labour and educational characteristics often move in opposing directions.

Keywords: Decomposition techniques · Living arrangements · Overall temporal gap · Education · Labour situation

1 Introduction

Leaving the parental home is one of the milestones in the transition to adulthood. This change occurs within the broader context of family, cultural, and socio-structural conditions and historical time. From this life course perspective, each person experiences a series of transitions or changes in status throughout their life; a personal sequence and combination of transitions. Becoming an adult means moving from roles typical of youth to roles typical of adulthood, and includes completing education, entering the labour market, leaving the parental home, finding a partner, and having children (*Billari/Liefbroer* 2010; *Schwanitz* 2017).

However, recently and in nearly all European countries, the sequencing of these events and the pace at which they occur have become less standardised, more diverse, and less predictable (*Ferrari/Pailhé* 2017). From the second demographic transition viewpoint, the process of transitioning into adulthood is changing due to changes in dominant norms, cultural beliefs, and increasing individualisation, allowing young individuals more freedom in choosing their lifestyles and personal living arrangements, as well as in planning their own lives.

Federal Institute for Population Research 2026

URL: www.comparativepopulationstudies.de
DOI: https://doi.org/10.12765/CPoS-2026-06
URN: urn:nbn:de:bib-cpos-2026-06en

Variations in the family model have also been affected by changing structural factors, such as educational patterns, which have led to a higher level of education for women and a change in their role in society, as well as an increase in their participation in the labour market.

This paper analyses the changes in the living arrangements of young Spanish adults from the latter part of the 20th century until 2018.[1] The timeframe analysed in the present study covers periods of economic growth and recession (including a housing boom and the subsequent Great Recession). The 1990s saw a period of economic boom in Spain, ending with the burst of the technology bubble in 1999-2000, followed by a mild recession in 2001 and 2002. From 2003 onward, a period of economic growth emerged, lasting until 2007-2008 when an economic crisis occurred, leading to the Great Recession in the early part of the 2010s. It was only from 2014 that the first signs of economic recovery were seen.

The economic expansion of the early 21st century brought with it a rapid growth in the residential independence of young people, but this trend reversed with the economic-financial crisis when the proportion of independent young adults dropped dramatically. Despite the economic recovery, the upward trend did not recover fully, and by 2018, the percentage of young people who achieved residential independence was well below the level seen during the real estate boom of the early 2000s.

Spain is an interesting case study because – as a Mediterranean country – it has distinctive features compared to other EU countries or the United States. It has a pattern of delayed residential independence, with independent young adults mostly living in couples. In addition, homeownership is the predominant housing tenure regime, at about 80 percent of households.

In order to analyse the changes over time in the living arrangements of young Spanish adults, we use decomposition techniques. We adapt the decomposition technique of *DiNardo et al.* (1996), known as the DFL method, for a categorical variable. The DFL technique examines differences on the entire distribution of the outcome variable, not solely on the mean or conditioned mean (as the Blinder-Oaxaca method does).

An important advantage of the DFL method and of our adaptation is that a functional specification for the analysis of the outcome variable is not required. In a temporal comparison, the structural conditions may have undergone important variations in such a way that if we force the functional form to be the same in all the periods, efficiency (consistency) would be lost.

In this study, we consider the most prevalent forms of cohabitation among the young Spaniards aged 18 to 35 to define our categorical outcome variable. This approach allows us to analyse independence from the parental home and whether the young adult who becomes independent does so with or without a partner. Thus,

[1] The last year included in the analysis is 2018, so as to avoid possible distortion by the exceptional circumstances caused by the COVID-19 pandemic. Data for a longer period that includes this exceptional situation will be available in the future.

we distinguish three options of living arrangements: (1) co-residing with parents, (2) becoming independent to live as a couple, and (3) becoming independent without a partner. The latter category includes all young adults who have left their parental home and live alone or share a residence with other adults.[2] Henceforth, these three options of living arrangements are here referred to as *Parents*, *Couple* and *No Couple*.

This paper contributes to the existing literature in several ways. First, the analysis distinguishes different options of living arrangements. Most studies to date on the transition to adulthood have only analysed residential independence; few have also considered the living arrangements of young adults, and rarely in a Spanish context. Second, previous studies that have analysed residential independence consider a functional form for the outcome variable. In this study, we adapt the DFL method to a categorical variable that allows temporal comparison without imposing any functional form on the model.

2 Determinants of leaving the parental home

The econometric literature establishes many decisive factors that affect residential independence: economic (*Aassve et al.* 2002; *Colom/Molés* 2021; *Ermisch/Di Salvo* 1997; *Le Blanc/Wolff* 2006); demographic (*Blaauboer/Mulder* 2010; *Chiuri/Del Boca* 2010; *Lauster* 2006; *Schwanitz et al.* 2017; *Stone et al.* 2011); cultural environment (*Allen et al.* 2004; *Holdsworth et al.* 2002; *Smits et al.* 2010); and housing market conditions (*Lee/Painter* 2013; *Mulder/Clark* 2000).

Factors such as age, gender, and level of education have a significant effect on residential outcomes. A common pattern across Western countries is that women become independent from their parental home between two and three years earlier than men do (*Chiuri/Del Boca* 2010; *Lauster* 2006; *Stone et al.* 2011). The level of education has different effects on independence in different countries (*Moreno* 2012; *Schwanitz et al.* 2017). Northern European countries show a positive relationship between education and leaving the home (*Blaauboer/Mulder* 2010). However, in Southern European countries, young adults tend to continue residing in the parental home while enrolled in education or until they have obtained a stable job (*Filandri/Bertolini* 2016; *Mandic* 2008).

Previous literature shows that an extension in the years of education and training for young adults has become more prevalent which – alongside the greater demand for a more qualified workforce – has led to an increased dependence on parents (*Newman* 2012; *Stone et al.* 2011). In Spain, this trend is reflected in an increase in cohabitation with one's parents among young adults who have a higher level of education (*Colom/Molés* 2021; *Vitali* 2010).

Choosing whether to live independently or with one's parents is associated with the costs and benefits (both economic and non-economic) of making that decision, along with the perception of the labour and housing market situations. When there

[2] Given the smaller shares of young adults in these situations, we combine them into a single category.

are fewer job opportunities in the labour market and the cost of housing grows more rapidly than income does, the path to young adulthood, and particularly to independent household formation, is more complicated.

The increase in unemployment rates and the presence of recessions reduce the rate of household formation (*Lee/Painter* 2013). Weak labour market conditions have a significant positive effect on cohabitation with parents and the option to move in and out of the parental home offers valuable security against the risks of the labour market (*Kaplan* 2012; *Mykyta* 2012). The proportion of young Spanish adults leaving the parental home is strongly influenced by the number of full-time employment contracts in periods of recessions (*Ahn/Sánchez-Marcos* 2017).

Housing market characteristics also influence the residential independence of young adults. In the Spanish context, where the real estate market displays notable regional differences, these factors are particularly relevant (*Echaves* 2017).

Cultural and social factors, in addition to economic ones, are essential to understanding the life trajectories of young Spanish adults (*Fuster et al.* 2023). Differences in social and economic structures among European countries help explain the greater delay in achieving residential independence among young adults in Southern European countries such as Spain (*Módenes et al.* 2013).

Our hypotheses

In this paper, we examine the impact of economic factors – particularly labour market conditions – on changes in living arrangements, as previous studies have done. Furthermore, we consider the effects of changes in educational attainment. To this end, we employ the DFL decomposition technique, adapted for use with a categorical variable comprising three categories. Notably, this methodological approach has not been previously applied in research on this subject.

Through the DFL technique, we aim to assess the relative contributions of observed characteristics and unobserved factors to the shift in living arrangements among young adults over time. In recent decades, cultural, social, and legislative transformations have influenced young adults' patterns of residential independence (*Fuster et al.* 2023). For young Spaniards, we hypothesise that unobserved factors, such as social and cultural changes, are likely to exert a greater influence on changes in living arrangements than observed characteristics (*Hypothesis H1*).

Regarding the observed factors, we focus on two key observed characteristics: labour situation and educational level. These variables capture the material and cognitive resources of young individuals and are essential to understanding their living arrangements and how these have evolved over time.

As in other countries, young Spanish adults are a particularly vulnerable group in the labour market and are highly sensitive to macroeconomic conditions. Employment stability offers financial security and thereby encourages residential independence. Conversely, high unemployment rates and housing prices that outpace wage growth reduce housing affordability and hinder the transition away from the parental home.

Recent changes in educational patterns and employment demands have led young adults to prolong their academic studies. While higher education may initially delay residential independence due to prolonged co-residence with parents (*Iacovou* 2010), it also enhances employment opportunities, thereby potentially facilitating independence (*Goldscheider/Goldscheider* 1998). This "dual effect" has been particularly observed in countries such as Spain, where prolonged education coexists with a desire for independence that is constrained by economic limitations (*Holdsworth* 2000). Accordingly, we hypothesise that the education and labour situation will exert opposing influences on changes in living arrangements (*Hypothesis H2*).

Changes in household formation trends are, as highlighted in the literature, closely linked to shifts in the economic context (*Matsudaira* 2016). Using Blinder-Oaxaca-type decomposition techniques, previous studies have found that economic conditions, such as the unemployment rate, exert a strong influence on variations in headship rates (*Cooper/Luengo-Prado* 2018; *Paciorek* 2016).

In the Spanish context, we expect the labour situation to be a more significant driver of change in living arrangements than educational attainment (*Hypothesis H3*).

Structural inequalities between men and women – particularly in terms of employment conditions and educational careers – likely shape their outcomes in living arrangements in distinct ways. The labour market situation may have a greater impact on men than on women, despite growing female labour participation (*Castellano/Rocca* 2018; *OECD* 2018). On the other hand, in Spain, women in younger cohorts have experienced faster growth in educational attainment than their male counterparts in recent decades (*OECD* 2018, 2021).

Accordingly, we hypothesise that changes in living arrangements will be more strongly associated with labour characteristics for men than with educational characteristics, whereas for women the opposite pattern is expected: educational characteristics will exert a stronger influence than labour characteristics (*Hypothesis H4*).

3 Decomposition method

In this paper, we present an unconditional decomposition procedure for a categorical outcome variable based on the DFL approach. In the following analysis, T is a random variable taking two values, t_0 and t_1, referring to the two time periods under analysis.

Our outcome variable Y is an unordered multinomial variable with three possible levels, $j = 1,2,3$, which is observed in two periods, t_0 and t_1, and the unconditional probabilities are denoted by P_{j,t_0} and P_{j,t_1}. This outcome variable is assumed to depend on certain observable characteristics, or endowments, x. The unconditional probability function is defined as:

$$P_{j,t} = P(Y = j/T = t) = \int P(Y = j/x;T = t)\, h(x/T = t)dx \qquad (1)$$

where $P(Y = j/x;T = t)$ is the conditioned probability function of Y given a particular value x, and $h(x/T = t)$ is the probability density function of attributes x in period t.

In order to quantify which share of the difference in outcome variable Y between t_0 and t_1 is due to the differences between both years in the observed characteristics, we need to calculate what the distribution of variable Y in t_1 would look like if endowments x remained unchanged relative to t_0. This function, known as the counterfactual probability function, is denoted by $P_{j,t_0 \rightarrow t_1}$, and is given by the following expression:

$$P_{j,t_0 \rightarrow t_1} = \int P(Y = j/x;T = t_1)\, h(x/T = t_0)\,dx \qquad (2)$$

The fundamental insight from the DFL method is that the counterfactual probability function in (2) is easy to implement using a re-weighting approach.

Using Bayes' rule, we present the following:

$$\frac{h(\boldsymbol{x}/T = t_0)}{h(\boldsymbol{x}/T = t_1)} = \frac{\dfrac{P(T = t_0/\boldsymbol{x})h(\boldsymbol{x})}{P(T = t_0)}}{\dfrac{P(T = t_1/\boldsymbol{x})h(\boldsymbol{x})}{P(T = t_1)}} = \frac{\dfrac{P(T = t_0/\boldsymbol{x})}{1 - P(T = t_0/\boldsymbol{x})}}{\dfrac{P(T = t_0)}{1 - P(T = t_0)}} = \tau_{t_0 \rightarrow t_1} \qquad (3)$$

i.e., $\tau_{t_0 \rightarrow t_1}(x)$ is simply the ratio of the conditional odds to the unconditional odds.

Hence,

$$h(x/T = t_0) = h(x/T = t_1)\,\tau_{t_0 \rightarrow t_1} \qquad (4)$$

Substituting in (2), we get

$$P_{j,t_0 \rightarrow t_1} = \int P(Y = j/x;T = t_1)\, h(x/T = t_1)\, \tau_{t_0 \rightarrow t_1}\, dx \qquad (5)$$

which differs from P_{j,t_1} only by the factor $\tau_{t_0 \rightarrow t_1}$, hereinafter called the re-weighting function. This needs to be estimated for the purpose of calculating the counterfactual probability function.

To do so, we use the pooled dataset of observations from both years (t_0 and t_1). The unconditional probability $P(T = t_0)$ in the expression (3) is estimated by the sample proportion with $T = t_0$, while the conditioned probability $P(T = t_0/x)$ can be obtained by parametric estimation of a binary response model, such as logit or probit.

We can decompose the overall gap of outcome variable Y for each choice alternative as:

$$P_{j,t_1} - P_{j,t_0} = (P_{j,t_1} - P_{j,t_0 \rightarrow t_1}) + (P_{j,t_0 \rightarrow t_1} - P_{j,t_0}) \qquad (6)$$

The first term in parentheses on the right of expression (6) is the difference associated with changes in endowments, as observable characteristics are evaluated at the two different periods, while the changes in preferences and/or unobserved factors is gathered by the second term.

If the unconditional probability function P_{j,t_1} and the counterfactual probability function $P_{j,t_0 \to t_1}$ are similar, the value obtained would be small for the first term of (6), suggesting that changes in the distribution of Y over time are not explained by changes in observed covariates (i.e., changes in returns or in preferences and unobserved characteristics are the factors mainly responsible for distributional differences). In contrast, when shifts in the outcome variable are explained by changes in endowments, the counterfactual probability function resembles the unconditional probability function P_{j,t_0}, and the second term of expression (6) must be negligible.

Effects of changes in a subset of characteristics

At times it is useful to identify the effect of a subset of characteristics on differences in the outcome variable. This can be done through decomposition in two steps.

Let $x = (x_1,x_2)$, and suppose that our first objective is to determine the effect of the subset x_1. That is, x_1 is the subset of target characteristics and x_2 the other attributes.

First, we calculate the counterfactual probability function of outcome variable Y when only this group of characteristics x_1 is evaluated in t_0, while the other attributes x_2 remain at values in t_1. This counterfactual probability function is denoted as $P_{j,x1,t_0 \to t_1}$:

$$P_{j,x1,t_0 \to t_1} = \int P(Y = j/(x_1,x_2);T = t_1)\, h(x_1/x_2;T = t_0)\, h(x_2/T = t_1)\, dx \tag{7}$$

We can see that:

$$\frac{h(\boldsymbol{x_1}/\boldsymbol{x_2};T=t_0)}{h(\boldsymbol{x_1}/\boldsymbol{x_2};T=t_1)} = \frac{\dfrac{P(T=t_0/(\boldsymbol{x_1},\boldsymbol{x_2}))h(\boldsymbol{x_1}/\boldsymbol{x_2})}{P(T=t_0/\boldsymbol{x_2})}}{\dfrac{P(T=t_1/(\boldsymbol{x_1},\boldsymbol{x_2}))h(\boldsymbol{x_1}/\boldsymbol{x_2})}{P(T=t_1/\boldsymbol{x_2})}} = \frac{P(T=t_0/(\boldsymbol{x_1},\boldsymbol{x_2}))}{P(T=t_1/(\boldsymbol{x_1},\boldsymbol{x_2}))}\cdot\frac{P(T=t_1/\boldsymbol{x_2})}{P(T=t_0/\boldsymbol{x_2})}$$
$$= \frac{P(T=t_0/(\boldsymbol{x_1},\boldsymbol{x_2}))}{1-P(T=t_0/(\boldsymbol{x_1},\boldsymbol{x_2}))}\cdot\frac{1-P(T=t_0/\boldsymbol{x_2})}{P(T=t_0/\boldsymbol{x_2})} = \tau_{\boldsymbol{x_1},t_0\to t_1} \tag{8}$$

where the conditioned probability $P(T = t_0/(x_1,x_2)) = P(T = t_0/x)$ can be obtained by parametric estimation of a binary response model, such as logit or probit and, similarly, $P(T = t_0/x_2)$ can be obtained by parametric estimation of a binary response model on variables x_2.

Hence, this counterfactual probability function is:

$$\begin{aligned} P_{j,x1,t_0 \to t_1} &= \int P(Y = j/(x_1,x_2);T = t_1)\, h(x_1/x_2;T = t_1)\, h(x_2/T = t_1)\, \tau_{x1,t_0 \to t_1}(x_1)\, dx \\ &= \int P(Y = j/x;T = t_1)\, h(x/T = t_1)\, \tau_{x1,t_0 \to t_1}\, dx \end{aligned} \tag{9}$$

which differs from (2) only by the factor $\tau_{x_1,t_0\to t_1}$.

Thus, we can write the next decomposition of the overall gap for each alternative:

$$P_{j,t_1} - P_{j,t_0} = (P_{j,t_1} - P_{j,x_1,t_0\to t_1}) + (P_{j,x_1,t_0\to t_1} - P_{j,t_0\to t_1}) + (P_{j,t_0\to t_1} - P_{j,t_0}) \qquad (10)$$

The decomposition in three factors given by (10) allows us to separately assess the effect of each group of variables x_1 and x_2 on the overall gap. The first term in parentheses will assess the effect of characteristics x_1, while the effect of characteristics x_2 is determined by the second term. Finally, the third term gathers the effect associated with changes in preferences and/or unobserved characteristics, as in expression (6).

Extending the decomposition to a larger number of variable subsets is straightforward and can be carried out sequentially. For example, if we consider $x = (x_1,x_2,x_3)$, the counterfactual probability function in which x_1 and x_2 are evaluated at their values in t_0, while the remaining attributes x_3 is kept at its values in t_1 can be expressed as:

$$\begin{aligned} P_{j,x_1,x_2,t_0\to t_1} &= \int P(Y = j/(x_1,x_2);T = t_1)\, h(x_1,x_2/x_3;T = t_1)\, h(x_3/T = t_1)\, \tau_{x_1,x_2,t_0\to t_1}\, dx \\ &= \int P(Y = j/x;T = t_1)\, h(x/T = t_1)\, \tau_{x_1,x_2,t_0\to t_1}\, dx \end{aligned} \qquad (11)$$

where

$$\tau_{\boldsymbol{x_1},\boldsymbol{x_2},t_0\to t_1} = \frac{P(T = t_0/\boldsymbol{x})}{1 - P(T = t_0/\boldsymbol{x})} \cdot \frac{1 - P(T = t_0/\boldsymbol{x_3})}{P(T = t_0/\boldsymbol{x_3})}$$

The decomposition of the overall gap for each alternative can be written as:

$$\begin{aligned} P_{j,t_1} - P_{j,t_0} &= (P_{j,t_1} - P_{j,x_1,t_0\to t_1}) + (P_{j,x_1,t_0\to t_1} - P_{j,x_1,x_2,t_0\to t_1}) \\ &\quad + (P_{j,x_1,x_2,t_0\to t_1} - P_{j,t_0\to t_1}) + (P_{j,t_0\to t_1} - P_{j,t_0}) \end{aligned} \qquad (12)$$

The effect associated with characteristics x_1 and that associated with characteristics x_2 are captured by the first and second terms in parentheses, respectively, while the third term reflects the contribution of the remaining characteristics x_3. The final term captures the changes in preferences and/or unobserved characteristics.

Estimation procedure

Next, we present the procedure used in the estimation of probability functions, i.e., both the unconditional and counterfactual functions.

To estimate the unconditional probability functions for unordered multinomial categorical variables, we use the frequency method, given by the following formula:

$$\tilde{P}(Y=j)=\tilde{P}_j=\frac{1}{n}\sum_{i=1}^{n}1(Y_i=j) \tag{13}$$

where subscript $i = 1,2,\cdots,n$ represents the sample individuals, Y_i is the response of individual i, $j = 1,\cdots,J$ are the categories of variable Y and $1(\cdot)$ is the indicator function.

As *Li* and *Racine* (2007) noted, the frequency method produces unbiased and asymptotically consistent estimators if the mass probability function has few mass points, but needs a large sample to operate well. Our variable Y has few mass points (only three) and our sample is large.

To estimate the counterfactual probability function, we use an adaptation of the kernel method with fixed bandwidth provided by *Aitchison* and *Aitken* (1976) for categorical variables. They propose estimating the probability function by the following estimator:

$$\hat{P}(Y=j)=\hat{P}_j=\frac{1}{n}\sum_{i=1}^{n}l(Y_i,j,\hat{\lambda}) \tag{14}$$

where $l(Y_i,j,\lambda)$ is a kernel function that depends on the bandwidth λ, and whose sum for all categories must be equal to 1 to ensure that $\hat{P}_j$ is a proper probability estimate lying between 0 and 1.

The kernel function proposed by Aitchison-Aitken is given by considering:[3]

$$l(Y_i,j,\lambda)=\begin{cases}1-\lambda & if\ \ Y_i=j\\ \lambda/(J-1) & if\ \ Y_i\neq j\end{cases} \tag{15}$$

In the estimation of the counterfactual probability functions, we weight each observation by the corresponding re-weighting function. Thus:

$$\hat{P}_{t_0\to t_1}(Y=j)=\hat{P}_{j,t_0\to t_1}=\frac{1}{n}\sum_{i=1}^{n}\hat{\tau}_{t_0\to t_1}\cdot l(Y_i,j,\hat{\lambda}) \tag{16}$$

where $\hat{\lambda}$ is the optimal bandwidth, which in our analysis is obtained with the classic least squares cross-validation method, and $\hat{\tau}_{t_0\to t_1}$ is the estimated re-weighting function obtained with the abovementioned estimation procedure. Weights are normalised to sum 1:

$$\sum_{i=1}^{n}\hat{\tau}_{t_0\to t_1}=1$$

3 It is easily verifiable that, for large samples, the estimator of the unconditional probability function obtained by this kernel function coincides with the one provided by the frequency method. A detailed discussion of the properties of this kernel function is provided by *Chu et al.* (2015).

4 Sample information and descriptive statistics

The data sources used to analyse the living arrangements of young Spanish adults are the Household Budget Survey (EPF) and the European Union Households Panel (PHOGUE), both conducted by the National Statistics Institute (INE). The EPF was carried out every 10 years from 1958 until 1990, when it was paused until 2006, and then implemented as an annual survey. We use the data of the EPF for 1990, 2010, and 2018. Since the EPF was not carried out in 2000, data for that year were obtained from the PHOGUE, which covers 1994-2000. According to the INE, both surveys are statistically compatible. In all the years we analyse, the same measurement of our variables of interest was used.

For the analysis, we select individuals aged between 18-35 years. After eliminating the invalid observations due to missing data in the variables of interest, the final size of samples is 18,801 for 1990, 11,077 for 2000, 13,228 for 2010 and 9,180 for 2018.

We distinguish three types of living arrangements: co-residing with parents, becoming independent to live as a couple (either married or in a common-law partnership), or becoming independent to live without a partner. We consider a young adult to be living independently if they or their partner are the head of the household. Young adults who temporarily live away from their parental home for study purposes are not considered independent. Cases where two or more households live in the same dwelling – such as young adults living with their partner and parents – represent a very small proportion of the young adults considered and are excluded from the analysis.

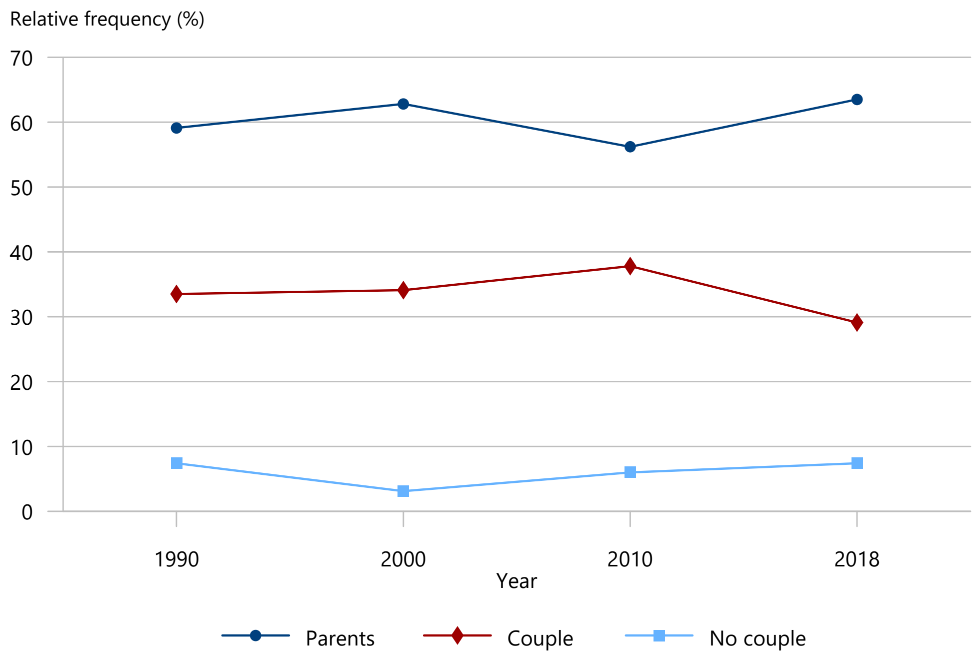
Figure 1 presents the sample percentage of young people in each of these living arrangements (*Parents*, *Couple*, and *No Couple*) over time.

Young Spanish adults exhibit a late pattern of independence; the arrangement with the highest shares across all observed decades is *Parents*. From the late 20th century through 2018, we find that the proportion of young adults who cohabit with their parents increased slightly (from 59.1 percent in 1990 to 63.5 percent in 2018). This growth fluctuated over the years, showing the lowest percentage in 2010 (56.2 percent). Among those young adults who leave the parental home, the majority choose to live as a couple. From 1990-2010, this percentage showed a slight increase (from 33.5 percent in 1990 to 37.8 percent in 2010), but experienced a notable decline in 2018 (falling to 29.1 percent). The percentage of young adults who become independent without a partner (*No Couple*) is quite small, with a particularly low share in 2000 (3.1 percent).

For each period analysed (1990-2000, 2000-2010, and 2010-2018), chi-square tests of independence were conducted to assess the association between living arrangements and year. The corresponding chi-square statistics were 241.823, 177.616, and 183.389, respectively, with p-values below 0.001 in all cases. These results indicate a statistically significant association in each period; however, the strength of this association appears modest, as reflected by the corresponding Cramer's V coefficients of 0.090, 0.085, and 0.090.

To examine the association between the different categories of living arrangements and years, Haberman-adjusted standardised residuals were computed for each

Fig. 1: Percentage of young adults aged 18-35 in each living arrangement option



Source: EPF 1990, 2010, 2018 and PHOGUE 2000 data

period. The results are reported in Table 1. Examining these residuals confirms the significant evolution in living arrangements illustrated in Figure 1. Overall, the findings suggest an increasing heterogeneity in living arrangements over time.

This study focuses on assessing the effects that education and the labour situation of young adults have on observed changes in living arrangements. Both are characteristics that, in the Spanish context, have undergone significant changes in recent years, as illustrated by the temporal evolution presented in Table 2.

The educational attainment of young Spanish adults shows notable changes over time. In 1990, more than half of young adults – those 18-35 years of age – had attained

Tab. 1: Haberman-adjusted standardised residuals

	Period 1		Period 2		Period 3	
	1990	2000	2000	2010	2010	2018
Parents	-6.3	6.3	10.4	-10.4	-10.9	10.9
Couple	-1.1	1.1	-5.9	5.9	13.5	-13.5
No Couple	15.5	-15.5	-10.8	10.8	-4.1	4.1

Source: own calculations based in EPF 1990, 2010, 2018 and PHOGUE 2000 data

Tab. 2: Variable definitions and temporal evolution (%)

Variables	Definition	1990	2000	2010	2018
Primary	Primary school education	52.3	36.9	37.4	29.2
Secondary	Secondary school education	35.7	45.1	40.9	46.6
University	University education	12.0	18.0	21.7	24.2
Student	Enrolled in education	17.4	22.1	22.2	31.1
Inactive	Inactive	35.5	30.8	27.5	34.9
Unemployed	Unemployed	14.0	12.2	19.8	15.3
Employed	Currently employed	50.5	56.9	52.7	49.7
Unemployment rate	Regional unemployment rate (%)	23.51	18.91	26.97	23.75

Source: own calculations based in EPF 1990, 2010, 2018 and PHOGUE 2000 data

only primary education, whereas just 12 percent had completed university studies and 17 percent were pursuing further academic education. Since the beginning of the 21st century, educational levels of young people have risen significantly, and by 2018, almost one quarter of young adults had obtained a university degree, with more than 31 percent currently enrolled.

The labour situation has also undergone changes. In years of economic recession, the unemployment rate grows, attenuating the difficulties young people have in finding employment (in 2010, the unemployment rate was close to 27 percent). In 2018, we observe a high percentage for the variable "inactive," which is possibly associated with the higher proportion of young adults continuing their education.

5 Results

In order to assess how much of the relative shift between two periods in the distribution of variable *Y*, indicating the living arrangements of young adults, can be explained by changes in observed attributes, *x*, we need to estimate the unconditional probability functions, P_{j,t_0} and P_{j,t_1}, and the counterfactual probability function, $P_{j,t_0 \to t_1}$.

The unconditional probability function $P_{j,t}$ is estimated using the frequency method, as shown in equation (13). The counterfactual probability function $P_{j,t_0 \to t_1}$ is estimated using equation (16) after fitting a logit model[4] to obtain the re-weighting functions, $\hat{\tau}_{t_0 \to t_1}$. The results of logit models are reported in Table A1 in the Appendix.

[4] The logit model includes as explanatory variables our target variables (education and labour situation), the individual's monthly income (in logarithms), and indicators for the size of the municipality of residence, distinguishing four categories: Size 1 (municipalities with 10,000 inhabitants or fewer), Size 2 (10,001-50,000 inhabitants), Size 3 (50,001-100,000 inhabitants), and Size 4 (100,000+ inhabitants).

Tab. 3: Unconditional and counterfactual probability estimates and bandwidths

		Parents	*Couple*	*No Couple*
	$\hat{P}_{j,1990}$	0.591	0.335	0.074
	$\hat{P}_{j,2000}$	0.628	0.341	0.031
	$\hat{P}_{j,2010}$	0.562	0.378	0.061
	$\hat{P}_{j,2018}$	0.635	0.291	0.074
$\hat{\lambda}_{90\to 00} = 0.0002195$	$\hat{P}_{j,90\to 00}$	0.615	0.360	0.025
$\hat{\lambda}_{00\to 10} = 0.0002265$	$\hat{P}_{j,00\to 10}$	0.491	0.441	0.068
$\hat{\lambda}_{10\to 18} = 0.0003558$	$\hat{P}_{j,10\to 18}$	0.630	0.293	0.077

Source: own calculations based in EPF 1990, 2010, 2018 and PHOGUE 2000 data

Table 3 presents, for different years, the estimated unconditional probability functions $\hat{P}_{j,t}$ (top of Table 3) together with the corresponding estimated counterfactual probability functions $\hat{P}_{j,t_0\to t_1}$ and the bandwidths (bottom of Table 3).

Parents is the most likely alternative in all the years analysed. We see an increase in this probability over time. This result appears to run counter to expectations that intergenerational co-residence would gradually decline with modernisation and cultural change (increasing individualisation and changes in gender roles), but it aligns with recent studies, such as *Esteve* and *Reher* (2021), who noted that a rise of intergenerational co-residence of young adults with their parents is occurring on a global scale.

The second most common type of living arrangement is independently living as a couple, which confirms the pattern of traditional Mediterranean behaviour observed among young Spanish adults. *Moreno* (2018), using data from Spanish youth from 2012, similarly finds that, among other factors, residential independence is strongly influenced by the presence of a partner.

The distance between the counterfactual probability $\hat{P}_{j,t_0\to t_1}$ and the unconditional probability $\hat{P}_{j,t_1}$ indicates whether or not the differences in observed characteristics play a role in the changes detected in the living arrangements of young adults over time. For example, when comparing 1990 and 2000, we see that the counterfactual probability $\hat{P}_{j,90\to 00}$ of *Parents* shows a non-negligible difference with respect to the corresponding unconditional probability $\hat{P}_{j,2000}$, indicating that endowments are playing some role in change detected in the probability. However, differences between the counterfactual probability and the unconditional probability $\hat{P}_{j,1990}$ also indicate that changes in the returns contribute to the observed variation.

In this study, we calculate the relative temporal variation of the probabilities, $\frac{\hat{P}_{j,t_1}-\hat{P}_{j,t_0}}{\hat{P}_{j,t_0}}$, to quantify the weight that the changes in the observed characteristics have in explaining the overall gap compared to the weight associated with the preferences or unobserved characteristics. This overall variation can be broken down as the sum of two terms, just like in (6), obtaining $\frac{\hat{P}_{j,t_1}-\hat{P}_{j,t_0}}{\hat{P}_{j,t_0}} = \frac{\hat{P}_{j,t_1}-\hat{P}_{j,t_0\to t_1}}{\hat{P}_{j,t_0}} + \frac{\hat{P}_{j,t_0\to t_1}-\hat{P}_{j,t_0}}{\hat{P}_{j,t_0}}$, where the first term on the right-hand side encompasses the part of the overall variation due to changes in observed characteristics, which is denoted as *relative endowments*, and the second term is the part associated with changes in preferences or unobserved characteristics, and is denoted as *relative returns*.

Table 4 presents the values (given in percentages) of the overall relative gap between decades and their corresponding decomposition. The overall gap exhibits differences over time and according to living arrangements. Between 1990 and 2000, the alternatives *Parents* and *Couple* show an increase (6.2 percent and 1.9 percent, respectively) while there is a significant drop in the alternative *No Couple*. For the period 2000-2010, we see that the probability of *Parents* suffered a 10.5 percent drop, while the probabilities of the two alternatives of residential independence increased. In the most recent period, 2010-2018, greater changes are observed in the probability of arrangements *Parents* and *Couple* with respect to the previous periods.

The results of this decomposition approach show that the weight of *relative endowments* is lower than the weight of *relative returns* in all periods. Young Spanish adults appear to have modified their preferences over living arrangements in response to cultural and social changes. These shifts, together with the characteristics of the financial market in each time period (credit restrictions, facilities to access mortgage loans, etc.), have largely shaped variations in their residential situation. This finding supports hypothesis *H1*, which stated that unobserved factors would exert a greater influence on changes in living arrangements than observed factors.

Tab. 4: Decomposition of relative temporal variation between decades (%)

	Parents	*Couple*	*No Couple*
1990-2000			
Overall relative gap	6.245	1.929	-58.261
Relative endowments	2.121	-5.661	8.609
Relative returns	4.124	7.590	-66.870
2000-2010			
Overall relative gap	-10.493	10.688	94.739
Relative endowments	11.262	-18.511	-24.381
Relative returns	-21.755	29.199	119.121
2010-2018			
Overall relative gap	12.938	-22.951	23.035
Relative endowments	0.783	-0.539	-3.908
Relative returns	12.155	-22.412	26.943

Source: own calculations based in EPF 1990, 2010, 2018 and PHOGUE 2000 data

Separate effects by groups of variables

In this section, we assess the separate effects of endowments – educational and labour characteristics – with the intention of quantifying both effects to see which is predominant in each timeframe.

In order to do this, in line with the procedure previously presented, we consider the subset of variables x_1 representing the labour situation variables (inactive, unemployed, employed and unemployment rate), x_2 representing the educational variables (primary, secondary, university and student), and the subset x_3 covering the remaining variables (monthly income, four indicators for the size of the municipality of residence).

The overall relative gap is decomposed into four factors, as shown in equation (12), giving us the expression,

$$\frac{\hat{P}_{j,t_1}-\hat{P}_{j,t_0}}{\hat{P}_{j,t_0}}=\frac{\hat{P}_{j,t_1}-\hat{P}_{j,\boldsymbol{x_1},t_0\to t_1}}{\hat{P}_{j,t_0}}+\frac{\hat{P}_{j,\boldsymbol{x_1},t_0\to t_1}-\hat{P}_{j,\boldsymbol{x_2},t_0\to t_1}}{\hat{P}_{j,t_0}}+\frac{\hat{P}_{j,\boldsymbol{x_2},t_0\to t_1}-\hat{P}_{j,t_0\to t_1}}{\hat{P}_{j,t_0}}+\frac{\hat{P}_{j,t_0\to t_1}-\hat{P}_{j,t_0}}{\hat{P}_{j,t_0}}.$$

The first and second terms on the right-hand side correspond to the contributions of changes in labour-related variables and educational variables, respectively. The third term reflects the contribution of the remaining variables, while the final term captures the part attributable to changes in preferences or unobserved characteristics.

A drawback of sequential decomposition is that the effect of a given factor generally depends on the order of the decomposition. We therefore repeated the analysis in reverse order to probe our results (considering x_2 first, and then x_1). The interpretation of the results remains unchanged. Results are reported in Table A2 in the Appendix.

Table 5 presents our relative temporal decompositions for the three time periods. In general, the effects of education and the effects of the labour situation tend to pull in opposing directions, which reduces the overall effect of endowments. This could be a possible explanation for the result obtained in the previous section, in which we found that the weight of the *endowments* is lower than the weight of the *returns*. Thus, we can confirm that our hypothesis *H2* (the effects of education and labour situation will operate in opposing directions) is supported by the data in most situations.

Table 5 shows that, between 1990 and 2000, the overall relative gap is mainly explained by educational characteristics in the arrangements *Parents* and *Couple*, with their weight exceeding the effects of both labour characteristics and the variables in x_3. Between 2000 and 2010, educational endowments accounted for only a minor share of the overall difference, whereas labour characteristics explained a substantially larger proportion. These results are not surprising, since during this decade there were no notable changes in educational patterns, while labour conditions deteriorated (see Table 2). Finally, between 2010 and 2018, both the

Tab. 5: Decomposition of relative temporal variation by groups of variables (%)

	Parents	*Couple*	*No Couple*
1990-2000			
Overall relative gap	6.245	1.929	-58.261
Relative endowments x_1 (labour)	-2.755	4.331	2.408
Relative endowments x_2 (education)	6.539	-12.262	3.208
Relative endowments x_3	-1.662	2.270	2.992
Relative returns	4.124	7.590	-66.870
2000-2010			
Overall relative gap	-10.493	10.688	94.739
Relative endowments x_1 (labour)	8.355	-14.818	-6.184
Relative endowments x_2 (education)	-1.447	2.399	2.904
Relative endowments x_3 (remaining)	4.354	-6.093	-21.102
Relative returns	-21.755	29.199	119.121
2010-2018			
Overall relative gap	12.938	-22.951	23.035
Relative endowments x_1 (labour)	-5.393	7.301	4.531
Relative endowments x_2 (education)	3.136	-4.153	-3.212
Relative endowments x_3 (remaining)	3.040	-3.687	-5.227
Relative returns	12.155	-22.412	26.943

Source: own calculations based in EPF 1990, 2010, 2018 and PHOGUE 2000 data

target characteristics (labour and educational) and the variables included in vector x_3 exert substantial effects, with labour characteristics having a greater impact than educational ones.

These findings are consistent with the fact that the labour situation is a more significant driver of changes in living arrangements than educational attainment is in periods with high unemployment rates and poor labour market conditions. Conversely, during periods of change with respect to educational attainment, the influence of educational factors is clearly greater than that of labour factors.

Our results highlight the importance of the observed variables (labour and educational) in variations in living arrangements. Contrary to what was hypothesised in *H3*, the labour situation does not always have a greater effect than the educational level.

Education has reinforced its role in shaping the living arrangements of young adults in Spain. As more youth access higher education, leaving the parental home has been increasingly delayed. However, this educational effect interacts with structural barriers – especially in the labour and housing markets – that limit young people's ability to establish independent households.

In contrast to previous research using US data – which has found that changes in cohabitation with parents over time are largely explained by economic factors such as the unemployment rate (*Cooper/Luengo-Prado* 2018; *Lee/Painter* 2013; *Matsudaira* 2016) – our results reveal higher educational effects during the 1990-2000 period, when educational variables experienced substantial changes.

Heterogeneous effects by gender

In this subsection, we analyse the factors responsible for changes in the living arrangements of young adults separately for men and women. Previous research (*Colom/Molés* 2021; *Chiuri/Del Boca* 2010; *Moreno* 2018; *Stone et al.* 2011) shows that gender differences in labour market position, educational trajectories, and family roles can lead to different outcomes in living arrangements according to gender.

Table 6 shows the estimated probability functions for men and women and the corresponding results of decomposition.

The upper panel of Table 6 confirms the earlier independence of women, established in previous studies, as shown by the unconditional probability results. While over 62 percent of young men continue to live with their parents, for women this percentage ranges from 50-58 percent.

The lower panel of Table 6 shows further gender differences, both in the value of the overall relative gap, and in the effect that labour and educational characteristics have on it. Women present an overall relative gap that is generally greater than that of men, which indicates greater changes in living arrangements among women.

The decomposition of the overall relative gap for both men and women shows that both *relative endowments* and *relative return*s are important in the shift of living arrangements.

When analysing the effects of each group of variables separately, the contribution of the variables included in vector x_3 to the overall gap generally does not exceed that of at least one of the target characteristics.

Regarding labour and educational variables, we find that, for men, labour factors generally exert the greatest influence in each period analysed, whereas educational factors have a non-negligible impact only in the 2000-2010 period.

For women, both labour and educational characteristics exert a significant influence, although their relative prominence varies across periods. In 1990-2000, changes in residential arrangement are mainly attributable to shifts in educational characteristics, which experienced considerable variation during this interval. In 2000-2010, only labour characteristics exert a substantial effect, whereas in 2010-2018, educational factors once again carry more weight than labour characteristics.

This gender-specific analysis reveals clear differences between young men and young women in the changes observed in their residential arrangement. Men show greater sensitivity to labour characteristics, as hypothesised in *H4*. For women, however, this hypothesis is only partially supported, since educational characteristics carry greater weight only in the first and last periods analysed.

Tab. 6: Estimated probability functions and decomposition: men and women

	Men			Women		
	Parents	*Couple*	*No Couple*	*Parents*	*Couple*	*No Couple*
$\hat{P}_{j,1990}$	0.651	0.286	0.064	0.530	0.384	0.086
$\hat{P}_{j,2000}$	0.676	0.292	0.033	0.580	0.390	0.030
$\hat{P}_{j,2010}$	0.621	0.312	0.067	0.502	0.444	0.054
$\hat{P}_{j,2018}$	0.687	0.236	0.078	0.582	0.346	0.072
$\hat{P}_{j,90\rightarrow00}$	0.742	0.230	0.027	0.567	0.413	0.020
$\hat{P}_{j,00\rightarrow10}$	0.531	0.386	0.084	0.475	0.469	0.055
$\hat{P}_{j,10\rightarrow18}$	0.711	0.213	0.076	0.552	0.372	0.076
1990-2000						
Overall relative gap	3.860	1.986	-48.482	9.483	1.504	-65.418
Relative endowments	-10.253	21.477	8.345	2.470	-6.024	11.724
x_1 (labour)	-7.924	16.872	5.219	-7.010	8.722	4.264
x_2 (education)	0.260	-0.911	1.441	10.423	-15.123	3.320
x_3 (remaining)	-2.588	5.516	1.684	-0.943	0.377	4.140
Relative returns	14.112	-19.491	-56.827	7.013	7.527	-77.142
2000-2010						
Overall relative gap	-8.078	7.012	104.341	-13.534	13.835	83.035
Relative endowments	13.406	-25.273	-51.632	4.555	-6.462	-4.188
x_1 (labour)	0.850	2.291	-37.967	6.101	-9.224	1.877
x_2 (education)	-1.623	2.137	14.477	0.002	0.005	-0.107
x_3 (remaining)	14.179	-29.701	-28.142	-1.548	2.757	-5.959
Relative returns	-21.484	32.285	155.972	-18.089	20.297	87.223
2010-2018						
Overall relative gap	10.574	-24.460	15.921	16.050	-22.068	32.104
Relative endowments	-3.839	7.288	1.657	5.994	-5.807	-7.931
x_1 (labour)	-7.258	13.098	6.299	-4.403	4.500	3.913
x_2 (education)	0.479	-0.889	-0.298	7.222	-7.505	-5.404
x_3 (remaining)	2.940	-4.921	-4.344	3.175	-2.803	-6.440
Relative returns	14.414	-31.748	14.264	10.056	-16.260	40.034

Source: own calculations based in EPF 1990, 2010, 2018 and PHOGUE 2000 data

Heterogeneous effects by age groups

The age of a young adult may determine behavioural differences, so the effects of the observable characteristics could be different in each age group. To test this, we consider two groups of young adults who we assume differ in their economic situation. The first group consists of young adults aged 30 or over who have already completed their education and whose employment situation is generally consolidated, allowing them to achieve residential independence and create a family unit. The second group is made up of younger adults who are still completing their studies or have just entered the labour market, and thus do not have enough resources to leave the parental home.

Table 7 shows the unconditional probability functions and the counterfactual probability function by these groups of young adults (top of Table 7), and the results of the corresponding decomposition of the relative temporal gap, both global and separated by groups of variables (bottom of Table 7).

Estimated unconditional probabilities $\hat{P}_{j,t}$ show that the majority of young adults between ages 18 and 29 live with their parents, exceeding 77 percent in every year observed. For young adults over 30 years of age, cohabitation with parents is much less common, reaching its highest value in 2018 (26.3 percent), while around 70 percent of young adults in this age group have already become independent and are living as a couple. *No Couple* is the option with the lowest probability in all years for both age groups.

The lower panel in Table 7 shows that, between the two most likely alternatives, *Couple* is the one with the greatest relative variation for the younger group, while for those over 30 years of age, the *Parents* alternative is the one with the greatest change.

Decomposition of the overall gap for the youngest group reveals that, between the years 1990 and 2000, the observed characteristics are mostly responsible for the change in the probability of the alternatives *Parents* and *Couple*. In the subsequent two decades, *relative endowments* continue to have significant weight, although the weight of *relative returns* has a higher value. Educational variables have the greatest importance in the 1990-2000 period, whereas the effect of labour variables dominates in 2000-2010. In 2010-2018, both labour and educational characteristics carry similar weight.

For the oldest age group, *endowments* exert a significant effect in the first and third decades, and virtually no effect in the 2000-2010 period. When labour and educational characteristics are considered separately, in general, labour variables have a greater weight than educational ones. Since older young adults have finished their education and have joined the labour market, it is logical that labour changes have the greatest effect on their residential situation.

In both groups of young people, the variables included in vector x_3 generally contribute less to the overall gap than the joint contribution of labour and educational characteristics.

Overall, the evidence suggests that the determinants of living arrangements gaps vary substantially by age group. While educational factors play a predominant role among the younger adults, labour factors emerge as the key driver for older young adults, whose educational paths are complete. This highlights the crucial role of the education-to-employment transition in shaping residential independence.

Tab. 7: Estimated probability functions and decomposition: age groups

	Age 18-29			Age 30-35		
	Parents	*Couple*	*No Couple*	*Parents*	*Couple*	*No Couple*
$\hat{P}_{j,1990}$	0.769	0.178	0.053	0.174	0.701	0.124
$\hat{P}_{j,2000}$	0.809	0.166	0.026	0.257	0.701	0.043
$\hat{P}_{j,2010}$	0.774	0.174	0.051	0.215	0.710	0.076
$\hat{P}_{j,2018}$	0.835	0.108	0.057	0.263	0.630	0.108
$\hat{P}_{j,90\rightarrow 00}$	0.778	0.200	0.021	0.234	0.733	0.033
$\hat{P}_{j,00\rightarrow 10}$	0.695	0.239	0.067	0.213	0.711	0.077
$\hat{P}_{j,10\rightarrow 18}$	0.822	0.116	0.062	0.235	0.665	0.100
1990-2000						
Overall relative gap	5.137	-6.789	-51.623	47.320	-0.100	-65.657
Relative endowments	3.933	-19.536	8.449	12.997	-4.628	7.895
x_1 (labour)	-0.265	0.273	2.916	5.847	-1.738	1.613
x_2 (education)	5.031	-22.629	2.919	4.384	-1.772	3.851
x_3 (remaining)	-0.833	2.820	2.615	2.767	-1.118	2.432
Relative returns	1.204	12.747	-60.072	34.323	4.528	-73.552
2000-2010						
Overall relative gap	-4.257	5.148	101.502	-16.333	1.298	76.761
Relative endowments	9.863	-38.974	-59.604	0.766	-0.122	-2.601
x_1 (labour)	5.594	-24.347	-19.266	2.412	-1.146	4.302
x_2 (education)	-1.621	6.538	8.937	0.166	0.102	-2.673
x_3 (remaining)	5.890	-21.165	-49.275	-1.812	0.921	-4.231
Relative returns	-14.120	44.123	161.106	-17.099	1.420	79.362
2010-2018						
Overall relative gap	7.803	-37.779	10.459	22.369	-11.276	42.389
Relative endowments	1.714	-4.618	-10.168	13.074	-5.016	9.981
x_1 (labour)	-1.681	6.904	1.926	10.372	-4.194	9.941
x_2 (education)	1.790	-6.850	-3.756	2.344	-0.522	-1.751
x_3 (remaining)	1.604	-4.672	-8.337	0.359	-0.299	1.791
Relative returns	6.089	-33.161	20.626	9.295	-6.260	32.409

Source: own calculations based in EPF 1990, 2010, 2018 and PHOGUE 2000 data

6 Conclusions

This study analyses the changes in living arrangements (*Parents*, *Couple*, and *No Couple*) of young Spanish adults from the latter part of the 20th century to the year 2018, spanning periods of both economic growth and recession. For our analysis, we present an adaptation of the DFL semi-parametric decomposition method to a categorical variable. In addition, we develop a relative temporal decomposition that allows us to assess the effect of labour characteristics separately from the effect of educational characteristics.

We find that unobserved factors or preferences (*returns*) have had a notable influence on the changes in residential independence and the formation of new households. Changes in observed characteristics (*endowments*) during the years analysed (1990, 2000, 2010, and 2018) are insufficient to explain the change that has occurred in the residential situation of young Spanish adults. In many cases, the effects of labour and educational characteristics take opposite directions, reducing the overall effect of endowments.

Analysing men and women separately reveals gender differences in the factors driving shifts in living arrangements. Educational factors have a substantial influence among women, whereas men appear more closely linked to labour-market dynamics, with education carrying only negligible weight.

Only in the 2000-2010 time period do we observe convergence between men and women, as labour-related characteristics predominate for both groups. This pattern aligns with the economic conditions of the real estate boom, which generated exceptional demand for low- and medium-skilled labour. In this context of abundant job offers and easily accessible employment, many young adults entered the labour market early – particularly young men, though young women were also affected. The subsequent housing market collapse led to reduced employment prospects, increasing the relative attractiveness of remaining in or returning to education as a strategy to buffer labour market uncertainty, especially among women. This shift is reflected in the period 2010-2018, when educational characteristics become the most influential for young women.

The analysis by age groups shows further behavioural differences in residential arrangements. The results for the older group (30-35 years old) indicate that changes in the labour situation have a greater influence than educational changes do. Since most young adults in this group have already finished their education and have joined the workforce, their residential situation will be closely linked to fluctuations in the labour market, making labour characteristics the main driver.

In the group of younger adults, aged 18-29, many are still in the educational system, making changes in academic characteristics more influential than in the older group. These findings reflect the fact that life course events differ by age, so education has a greater influence on changes in the living arrangements of younger adults, while the labour situation has a greater influence on the older group.

Overall, the findings show that educational factors are more relevant for younger adults, while labour characteristics dominate for older ones. This differentiation highlights the critical role of the education-to-employment transition in shaping living arrangements, and the importance of accounting for age heterogeneity when analysing youth residential patterns.

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Date of submission: 04.02.2025 *Date of acceptance: 04.03.2026*

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Appendix

Tab. A1: Logit model estimates

Variables	Definition	1990-2000 Coefficient	1990-2000 Standard Error	2000-2010 Coefficient	2000-2010 Standard Error	2010-2018 Coefficient	2010-2018 Standard Error
Intercept		0.132**	0.057	0.897***	0.060	-0.209***	0.065
Secondary	Secondary school education	-0.512***	0.029	-0.085***	0.032	-0.145***	0.034
University	University education	-0.655***	0.038	-0.539***	0.039	-0.087***	0.040
Student	Enrolled in education system	-0.871***	0.046	0.332***	0.058	-1.072***	0.076
Inactive	Inactive	0.373***	0.052	0.597***	0.058	0.307***	0.078
Unemployed	Unemployed	-0.039	0.044	-0.223***	0.045	0.149***	0.048
Unemployment rate	Regional unemployment rate (%)	0.035***	0.001	-0.055***	0.001	0.029***	0.001
Size 2	10,001-50,000 inhabitants	-0.162***	0.037	-0.078**	0.039	-0.098**	0.039
Size 3	50,001-100,000 inhabitants	-0.421***	0.057	-0.231***	0.055	0.115**	0.055
Size 4	more than 100,000 inhabitants	0.239***	0.032	0.171***	0.035	-0.070*	0.037
Income	Individual's monthly income[a]	-0.011	0.007	0.016***	0.006	0.033***	0.007
R2_McFadden		0.057		0.087		0.034	

Note: * $p < 10\%$; ** $p < 5\%$; *** $p < 1\%$; [a] in logarithms
Reference variables: primary school education, employed, and municipalities with 10,000 inhabitants or fewer.
Source: own calculations based in EPF 1990, 2010, 2018 and PHOGUE 2000 data

Tab. A2: Decomposition of relative temporal variation by groups of variables (%). Reverse path

	Parents	*Couple*	*No Couple*
1990-2000			
Overall relative gap	6.245	1.929	-58.261
Relative endowments x_1 (educational)	10.318	-18.996	3.481
Relative endowments x_2 (labour)	-6.534	11.066	2.136
Relative endowments x_3 (remaining)	-1.662	2.270	2.992
Relative returns	4.124	7.590	-66.870
2000-2010			
Overall relative gap	-10.493	10.688	94.739
Relative endowments x_1 (educational)	-0.390	0.730	-0.133
Relative endowments x_2 (labour)	7.298	-13.148	-3.147
Relative endowments x_3 (remaining)	4.354	-6.093	-21.102
Relative returns	-21.755	29.199	119.121
2010-2018			
Overall relative gap	12.938	-22.951	23.035
Relative endowments x_1 (educational)	4.258	-6.473	0.832
Relative endowments x_2 (labour)	-6.515	9.620	0.488
Relative endowments x_3 (remaining)	3.040	-3.687	-5.227
Relative returns	12.155	-22.412	26.943

Source: own calculations based in EPF 1990, 2010, 2018 and PHOGUE 2000 data

Comparative Population Studies

www.comparativepopulationstudies.de

ISSN: 1869-8980 (Print) – 1869-8999 (Internet)

Published by
Federal Institute for Population Research (BiB)
65180 Wiesbaden / Germany

E-mail: cpos@bib.bund.de