The Economic and Labour Relations Review (2024), **35**, 140–162
doi:10.1017/elr.2024.2

ORIGINAL ARTICLE

Gender gap in residential independence and employment of young people

M. Consuelo Colom Andrés and M. Cruz Molés Machí

Economía Aplicada, Facultad de Economía, Universitat de València, Valencia, Spain
Corresponding author: M. Cruz Molés Machí; Email: cruz.moles@uv.es

(Received 11 August 2022; revised 21 December 2023; accepted 28 December 2023; first published online 30 January 2024)

Abstract

Residential independence and incorporation into the labour market are two fundamental aspects of the transition of young people to adulthood, and gender differences have been observed in both. This study aims to determine the reasons behind the gender gap seen in young adults leaving their parental home and in finding paid employment. We analyse both the decisions of residential independence and employment jointly, for the sample of men and that of women. We separate the influence of observed factors from the influence of unobserved factors or preferences on the gender gap using decomposition techniques. The analysis is carried out for two points in time; this temporal comparison can help demonstrate whether the recent social changes experienced have modified the behaviour patterns of young people. Our findings indicate that, in accordance with the trend observed in recent decades in Europe, there is a convergence between men and women in the residential independence of young adults in Spain. However, in the labour market, there is still much to be done to reduce the gender gap. One recommendation arising from our study would be to promote policies which further improve the conciliation of family and work life, since this could reduce female labour abandonment associated with starting a family or motherhood.

Keywords: decomposition techniques; gender gap; labour insertion; residential independence; young people

JEL Codes: C35; J13; J71

Introduction

For young people on the path to adulthood, aspects such as the completion of education or training, incorporation into the labour market, or residential independence are intertwined and linked to the prevailing social norms at the time of the event in the young person's life. Most young people leave the parental home after joining the labour market. However, there are young people who leave the parental home but remain financially dependent, such as students. There are also those who join the labour market and continue co-residing with parents, perhaps because the remuneration from their jobs does not enable them to achieve residential independence, or because they choose to remain in the parental home longer in order to save and have more financial security when they finally decide to become independent.

This paper focuses on young adults' residential independence and incorporation into the labour market, two fundamental aspects in the transition of young people to adulthood. The analysis of these two aspects is of great interest, since, in recent years,

© The Author(s), 2024. Published by Cambridge University Press on behalf of The University of New South Wales. This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted re-use, distribution and reproduction, provided the original article is properly cited.

some countries have seen a delay in the age at which young people leave the parental home. The latter may be attributed to various factors, such as the decision to extend the education and training period, a growing increase in temporary employment, or the increasing difficulty in accessing housing, either rented or owned. Likewise, an extension in the years of education may be responsible for the observed postponement of the entry of young people into the labour market.

Gender differences are also reflected in the decision to live independently and to work outside the home. Women seek independence from the parental home 2 to 3 years earlier than men (Blaauboer and Mulder 2010; Chiuri and Del Boca 2010). Women also tend to either leave the labour market or to reduce their working hours with motherhood, while men are less likely to give up their job for childcare reasons (Alawad et al 2020; Bayrak and Tatli, 2018; Bell and Blanchflower 2011).

The research question in this paper sets out to identify the main determinant factors for residential independence and participation in the labour market for young people in Spain, as well as to determine the reasons behind the gender gap in these two important aspects of a young adult’s life. Given that the economic conjuncture at a given period of time may determine both incorporation into the labour market and the residential independence of young people, our study is carried out for two periods of time (a period of economic recession and a period of economic recovery).

The first period selected is the year 2010, a period of economic recession caused by the financial crisis and the bursting of the housing bubble. This crisis, with high unemployment rates, led to difficulties for young people in entering the labour market and greater precariousness in working conditions, making it harder to access housing and achieve residential independence. The second period studied is the year 2018, chosen as a benchmark for being the period in which economic recovery began. The economic recovery provided young adults with more favourable conditions for entering the labour market and achieving residential independence. An analysis of these two years can help to explain if the different economic conjunctures along with the social and demographic changes which have taken place in Spain in recent decades have shifted the behaviour of young adults in their response to these decisions.

In order to carry out this analysis, we first estimate a bivariate probit model separately for men and women. This model enables us to analyse residential independence and participation in the labour market jointly, since it considers the existence of a relationship between them. A comparison by gender of the degree to which the socio-demographic and economic characteristics of the young adult, as well as the characteristics of the region of residence, affect these decisions allows us to establish differences in behaviour between men and women.

To determine the reasons behind the gender gap, we use decomposition techniques that allow us to separate the influence of observed factors from the influence of unobserved factors, including tastes and preferences.

Decomposition techniques were pioneered by Blinder (1973) and Oaxaca (1973), who analysed the wage gap between men and women for an average individual. Decomposition methods examining differences in the entire distribution of the outcome variable (not only on average) have since been developed. DiNardo et al (1996) studied the effects of changes of labour market factors between 1971 and 1992 on the distribution of wages. Machado and Mata (2005) decomposed changes in the distribution of wages over a period of time into several factors using quantile regressions, essentially performing the Blinder-Oaxaca decomposition across the entire distribution of the outcome variable.

In most applications using decomposition techniques, the variable of interest is continuous (wages, housing prices, etc.), and little attention has been paid to discrete outcome variables. However, some studies can be found in the literature that decompose, for a discrete outcome variable, the difference between two groups into the mean or conditional mean (Cooper and Luengo 2018; Coulson and Dalton 2010; Kalb et al 2012).

In our study, since the gender gap and its causes can differ throughout the distribution of both the rate of residential independence and the employment rate, we adapt the method proposed by Machado and Mata (2005) to a categorical outcome variable with two possible values (0 and 1). We aim to carry out the decomposition of the gap at each of the percentiles of the distribution of the probability where our outcome variable (residential independence or participation in the labour market) takes the value 1 (as explained in detail in “Decomposition technique”).

This analysis advances the study of the relationship between two fundamental aspects of the transition to adulthood by providing information on the behaviour of young people when faced with residential independence and employment decisions. The analysis of these decisions by gender provides information that can be useful for reforming gender and labour market policies.

Unlike previous studies, in this paper, the gender gap analysis is carried out in the different percentiles of the distribution of the outcome variable. Using this procedure, we detect that, for the groups of young people with the greatest difficulties in achieving residential independence or entering the labour market (low percentiles of distribution), even after controlling for individual-specific characteristics, there is still a substantial part of the observed gender gap that remains unexplained.

Furthermore, by carrying out an analysis at two points in time that represent different economic situations (recession and recovery), we show the effect of the country’s economy on the gender gap in both the rate of residential independence and that of employment. Our findings indicate that, in accordance with the trend observed in recent decades in Europe, a convergence between men and women in the residential independence of young adults in Spain is seen. In the labour market, however, there is still much to be done to reduce the gender gap associated with employment.

The paper is laid out as follows. **Background** presents a review of existing literature. **Methodology and empirical strategy** shows the model and the decomposition technique used in the analysis, together with the description of data and variables. **Analysis of results of bivariate probit model** presents the corresponding interpretation of the results from the estimation of the model, while **Analysis of gender gap** outlines the application of the decomposition technique. The main conclusions are in the last section.

Background

Previous literature on youth residential independence has established the importance of both the young adult’s socio-demographic and economic characteristics (Lauster 2006; Mandic 2008; Stone et al 2011) and the characteristics of the labour market and the housing market and of the welfare system (Aassve et al 2002).

In recent decades, an increase in the age of residential independence has been detected (Billari and Liefbroer 2010). Many young people are also seen to remain co-residing with their parents until they finish their academic studies (Mandic 2008; Stone et al 2011).

A key factor in the process of leaving the parental home is the young adult’s economic capacity; a higher level of income implies a greater predisposition to residential independence (Le Blanc and Wolff 2006).

The situation of the labour market (wage level, unemployment rate, unemployment benefits, etc.) and house prices are influencing the patterns and trends of intergenerational coexistence (Esteve and Reher 2021). Ahn and Sánchez-Marcos (2017) find that, despite the economic difficulties associated with the crisis, during the last recession an increasing trend was detected in the rate of residential independence of Spanish youth, and that this increase is directly linked to full-time employment contracts. Colom and Molés (2022) obtained that the regional dynamics of the housing market (housing purchase prices) do have a clear influence on co-residing with parents of Spanish Millennials.

The customs, tradition, or culture of the environment are also important aspects in the patterns of residential independence of young people (Aassve et al 2013). Vitali (2010) found that for Spanish youth living in a modern cultural context implies a greater predisposition to leave the parental home compared to living in a traditional environment.

The policies of the government of each country (social policies, educational policies, labour policies, housing policies, or family support policies) should also be taken into account due to their impact on both residential independence and the employment of young people. Aparicio-Fenoll and Oppedisano (2015) find that a subsidy for rent has a positive effect on the residential independence of young people in Spain.

Most Mediterranean countries, including Spain, have a weak social state and a welfare system bolstered by family support. Thus, a young adult's income plays a significant role in achieving residential independence. A young adult needs to be able to support him/herself with sufficient income from a paid job before making the decision to leave the parental home (Ahn and Sánchez-Marcos 2017; Colom and Molés 2022; Vitali 2010).

Incorporation into the labour market depends on the human capital associated with the individual and on their family and personal circumstances. Educational level, age, or gender are decisive factors in the entry of young people into the labour market (Becker et al 2010; Grigoli et al 2018).

Also, the economic situation at each moment in time has a significant impact on employment. In times of economic recession, the labour market becomes precarious and young people are negatively affected by less employment opportunities (Alawad et al 2020; Bayrak and Tatli 2018; Bell and Blanchflower 2011).

In both residential independence and employment, gender differences have been observed. Previous studies have shown that men remain in the parental home until they achieve job stability and economic autonomy (Blaauboer and Mulder 2010; Chiuri and Del Boca 2010; Lauster 2006; Mandic 2008; Mulder et al 2002; Stone et al 2011; Vitali 2010). However, women find a partner at an earlier age and, more often than not, take on the role of housewife, leaving the man as the main earner. This is what could be called a pattern of 'dependent independence' and highlights the persistence of cultural patterns that result in women taking on the central role in the home (Blaauboer and Mulder 2010; Chiuri and Del Boca 2010). Fitzenberger et al (2004) compare the pattern of labour market participation and employment over the life-cycle of men and women of different skill levels in West Germany and confirm the existence of a persistent gender gap.

The existence of an unobservable cultural factor, such as differences in preferences regarding family structure and women's roles in the labour market versus housework, is likely responsible for the large cross-country variation in the female rate of labour force participation, as well as gender differences (Antecol 2000). Banerjee (2019) carries out an analysis of the gender gap in the labour participation rate in India and concludes the existence of social and cultural norms acting behind the gender gap. The employment decisions of men and women are often conditioned by occupational segregation by gender. Dueñas et al (2014) analyse the motives behind occupational segregation in Spain and find that there is differential treatment in the labour market of the same characteristics depending on gender, as well as an assessment of job conditions as regards the family and work conciliation that differs between men and women.

This paper makes several contributions to the literature on the topic. First, the determinants of residential independence and the labour incorporation of young people are jointly analysed, which is relevant given the existing link between both decisions. In the econometric literature on these topics, there are very few studies that have explored this link up until now.

Second, the gender gap in the rate of residential independence and in the rate of employment of young people is analysed through decomposition techniques, which enable assessment of the importance of unobserved factors (such as the implication of women in housework or caring for children or the elderly) compared to the importance of observed socio-demographic and economic characteristics. Since the gap decomposition is carried out across the entire distribution of the outcome variable, the effects of the two groups of factors can be determined at any level of the distribution (from young people with low probability to young people with a high probability).

Methodology and empirical strategy

In order to examine the overall characteristics and determinants influencing the residential and employment status of young adults in Spain, paying special attention to the differences between men and women and any changes over time, we estimate, with data from the years 2010 and 2018, a bivariate probit model separately for men and women. The choice of this model is based on the fact that it considers the existence of a relationship between both decisions. This estimation procedure helps to shed light on these two important aspects of young people's lives, to identify their determinants and to estimate their effects.

We also aim to measure the impact of individual-specific characteristics and that of the unobserved factors on the gender gap. In order to do this, we adapt the decomposition technique proposed by Machado and Mata (2005) to a dichotomous variable. With this adapted technique, we analyse the main factors responsible for the gender gap, separating the effect attributed to observed characteristics from the effect associated with unobserved factors at each of the percentiles of the distribution.

Data and variables

Our study uses data related to Spanish young people aged between 18 and 35, obtained from the Family Budget Survey (EPF) for the years 2010 and 2018. This survey, carried out by the National Institute of Statistics (INE), provides annual information on income, consumption expenses, and living conditions of households, as well as their members.

The final sample, after eliminating the invalid observations due to missing data in the variables of interest, consists of 13005 individuals for 2010 (6458 women and 6547 men) and 9023 individuals for 2018 (4511 women and 4512 men).

The covariates used in model collect both socio-demographic and economic characteristics of the individual and features of the region in which the individual resides. Table 1 presents the definition of these explanatory variables and the corresponding descriptive statistics can be found in the Appendix.

The characteristics of young adults included as explanatory variables of residential independence are age, attained educational level, whether the young person is studying, whether the young person does not have Spanish nationality and the salary income. These variables are closely related to the transition to adulthood and are likely to be key determinants of residential independence (Billari and Liefbroer 2010; Le Blanc and Wolff 2006; Mandic 2008; Stone et al 2011).

Education can be regarded as a measure of human capital that serves as an indicator of future earnings. The economic capacity is decisive in the residential situation. Young adults with higher incomes have a greater possibility of forming an independent household. Age will also mark the moment of residential independence. The younger the young person is, the greater the possibility that he or she will continue to reside in the parental home.

Table 1. Variables definition

Variables	Definition
Dependent Variables	
Independence	1=Residential independence
Employment	1=Employment
Individual Variables	
Age	
Age18[a]	Between 18 and 23 years old
Age24	Between 24 and 29 years old
Age30	Between 30 and 35 years old
Education Level	
Primary[a]	Primary school education
Secondary	Secondary school education
University	University education
Student	Pursuing studies
Living arrangements	
Couple	Living as a couple
Descendants	Children under 15 years
Nationality	
Foreign	Non-Spanish nationality
Income	
Individual Income[b]	Monetary income of young adult (euros)
Non-Individual Income[b]	Income of other household members (euros)
Regional variables	
Rural[d]	Rural population ratio (%)
Price[b,c]	Price of purchase of housing per square metre

Notes:
[a]Reference variable;
[b]in logarithms.
Sources:
[c]Ministry of Development;
[d]INE.

The socio-demographic and economic characteristics of the individual considered as explanatory of participation in the labour market are whether the young person lives with a partner, if he/she has children under the age of 15 and the income of other household members, in addition to age, educational level, and nationality. Age, level of education, and nationality are known to be determining factors in the labour market (Becker et al 2010; Grigoli et al 2018). The variables *Couple* and *Descendants* seem to be good predictors of employment decisions and may affect men and women differently in their decision to enter the labour market. Income of other members of the household, predictably, will discourage the young person from entering the labour market.

In both decisions, the structure of the region in which the young person resides is also taken into account through the proportion of the rural population (population residing in municipalities with less than 5,000 inhabitants) and, as an indicator of the situation of the real estate market, the housing price has been considered. The proportion of rural population is used as a measure to consider regional differences on population structure, since the existing culture and preferences regarding family formation and labour participation differ between rural and urban areas. In residential independence, according to Ermisch (1999), the expected effect due to the purchase price of housing is ambiguous and depends on the price elasticity of parents' housing demand.

Bivariate probit model

The bivariate probit model used to analyse the residential independence of young people and their participation in the labour market consists of two equations. In the first, the dependent variable I_F takes the value 1 if the young adult decides to become independent from the parental home and the value 0 if the young adult co-resides with the parents, and in the second equation, the dependent variable I_E takes the value 1 if the young adult has a job and the value 0 if not:

$$I_F = \begin{cases} 1 & \mathit{if} \quad \boldsymbol{z}_{\boldsymbol{F}}^{'}\boldsymbol{\delta}_{\boldsymbol{F}} + \upsilon_F > 0 \\ 0 & \mathit{if} \quad \mathit{not} \end{cases}$$

$$I_E = \begin{cases} 1 & \mathit{if} \quad \boldsymbol{z}_{\boldsymbol{E}}^{'}\boldsymbol{\delta}_{\boldsymbol{E}} + \upsilon_E > 0 \\ 0 & \mathit{if} \quad \mathit{not} \end{cases} \tag{1}$$

where $\boldsymbol{z}_{\boldsymbol{F}}$ and $\boldsymbol{z}_{\boldsymbol{E}}$ are the vectors of the explanatory variables, $\boldsymbol{\delta}_{\boldsymbol{F}}$ and $\boldsymbol{\delta}_{\boldsymbol{E}}$ are the vectors of unknown parameters, and $(\upsilon_F, \ \upsilon_E)$ is the random component of the bivariate model of residential independence and employment that follows a bivariate normal distribution with a null mean vector and a matrix of variances-covariances that considers correlation ρ between the random disturbances.[1]

Decomposition technique

The gender gap in the residential independence rate and in the employment rate is analysed using decomposition techniques. These techniques enable us to separate the effect attributed to the observed characteristics from the effect associated with preferences and unobserved factors. By considering the differences in all percentiles, we examine the gender gap in the entire distribution of the outcome variable which, in this study, is a discrete variable (non-continuous variable).

Blinder (1973) and Oaxaca (1973) proposed for a linear model, $Y = \beta x$, a decomposition of the difference in the means of an outcome variable Y (overall gap) between two groups A and B:

$$\begin{aligned} \bar{Y}_A - \bar{Y}_B &= \beta_A \bar{x}_A - \beta_B \bar{x}_B = (\beta_A \bar{x}_A - \beta_A \bar{x}_B) + (\beta_A \bar{x}_B - \beta_B \bar{x}_B) \\ &= \beta_A(\bar{x}_A - \bar{x}_B) + \bar{x}_B(\beta_A - \beta_B) = \Delta_X + \Delta_\varepsilon \end{aligned} \tag{2}$$

where x is the vector of covariates, β is the vector of regression coefficients, and the subscript (A and B) indicates the group considered (group A and group B).

The first term of (2), Δ_X, represents the differences in observable characteristics and is named the *explained part*. The second term, Δ_ε, collects the differences in the estimated coefficients and is called the *unexplained part*.

Fairlie (2005) adapted the Blinder-Oaxaca decomposition technique analysing differences between two groups in the mean of a dichotomous outcome variable (Logit and Probit models).

Machado and Mata (2005) perform the Blinder-Oaxaca decomposition across the entire distribution of the outcome variable, decomposing the differences between two groups A and B in the quantiles as

$$Q_\theta\big(f(x_A;\beta_A)\big) - Q_\theta\big(f(x_B;\beta_B)\big) = \big[Q_\theta\big(f(x_A;\beta_A)\big) - Q_\theta\big(f(x_B;\beta_A)\big)\big] + \big[Q_\theta\big(f(x_B;\beta_A)\big) - Q_\theta\big(f(x_B;\beta_B)\big)\big] \quad (3)$$

where x is the vector of covariates, β is the vector of quantile regression coefficients, $f(x;\beta)$ is the density of outcome variable, $Q_\theta(\cdot)$ is the corresponding quantile, and the subscript (A and B) indicates the group considered.

Fesselmeyer et al (2012) present, for a binary response variable, a decomposition over the entire distribution considering the semi-parametric method of Klein-Spady to estimate the probabilities.

We adapt the idea of comparison of quantiles proposed by Machado and Mata (2005) to a discrete choice model, defined through a probability distribution, for which, in our case, we use the bivariate probit model.

The probability of the outcome variable takes the value j, for an individual i from group k, named choice probability, is given by

$$p_{ij}^k = P\big(I_i = j/z_i^k \boldsymbol{\delta}^k\big) \quad (4)$$

where $k = A,\ B$ are the two groups of individuals for which the comparison is to be made, I_i is the outcome variable, $j = 1,\ 2,\ \ldots, J$ are the choice alternatives, z_i^k is the vector of observable characteristics, and $\boldsymbol{\delta^k}$ is the parameter vector of the discrete choice model.

The choice probability associated with group A if the characteristics of group B were considered, which we call the counterfactual probability, is obtained from the expression:

$$p_{ij}^{AB} = P\big(I_i = j/z_i^B \boldsymbol{\delta}^A\big) \quad (5)$$

For each possible choice alternative j, the percentile α of a certain group k is defined as the value $\xi^k(\alpha)$ that verifies:

$$\frac{1}{N_k}\sum_i 1\Big(p_{ij}^k \le \xi^k(\alpha)\Big) = \alpha \quad (6)$$

where $1(\cdot)$ is the indicator function and N_k the number of individuals of group k in the sample.

The decomposition of the difference of the outcome variable in the different percentiles can be considered in the following terms:

$$\xi^A(\alpha) - \xi^B(\alpha) = \big[\xi^A(\alpha) - \xi^{AB}(\alpha)\big] + \big[\xi^{AB}(\alpha) - \xi^B(\alpha)\big] \quad (7)$$

being $\xi^A(\alpha)$ the α percentile of group A, $\xi^B(\alpha)$ the α percentile of group B, and $\xi^{AB}(\alpha)$ the α percentile of the counterfactual distribution.

Thus, for each α percentile, the difference in the outcome variable (overall gap) between groups A and B decomposes into an *explained part* or *endowment effect*, attributed to the existence of differences in the observable characteristics of the two groups (first term of (7)) and in an *unexplained part* or *return effect*, which is associated with differences in unobservable characteristics and preferences (second term of (7)). The unexplained part symbolises the pure effect of discrimination in terms of the influence of unobserved predictors, such as the preferences of individuals in both groups.

Analysis of results of bivariate probit model

This study aims to make comparisons between two groups of young adults at two points in time. An extensive debate can be found in the econometric literature about the most appropriate procedure to use in non-linear models for making comparisons between groups whose sample information is different. Alternative solutions exist to resolve this issue in models where standard coefficient equality tests are not adequate, such as in non-linear

Table 2. Marginal effects of residential independence and employment model

	2010		2018	
	Women	Men	Women	Men
Residential independence				
Age 24	0.0931***	0.0831***	0.0297*	−0.0435***
Age 30	0.2726***	0.2605***	0.1845***	0.1026***
Secondary	−0.0292*	−0.0117	−0.0525***	0.0011
University	−0.0982***	−0.0445***	−0.0966***	−0.0158
Student	−0.3410***	−0.2539***	−0.2479***	−0.1863***
Foreign	0.2419***	0.2513***	0.1754***	0.1252***
Individual income	0.0348***	0.0483***	0.0414***	0.0579***
Price	0.0395**	0.0062	−0.0179	−0.0071
Rural	0.0002	−0.0008*	−0.0006	−0.0012**
Employment				
Age 24	0.1560***	0.1821***	0.1852***	0.2281***
Age 30	0.1138***	0.1702***	0.1339***	0.1943***
Secondary	0.1323***	0.0948***	0.0794***	0.0046
University	0.2613***	0.1579***	0.1763***	0.0693***
Foreign	−0.0958***	−0.0879***	−0.1224***	−0.0379**
Couple	0.3723***	0.3745***	0.4118***	0.4295***
Descendants	−0.0903***	−0.0296	−0.0826***	−0.0543**
Non-individual income	−0.0569***	−0.0272***	−0.0517***	−0.0408***
Price	0.1554***	0.0831***	0.1050***	0.0693***
Rural	0.0016***	0.0016***	0.0008	0.0010
Correlation between residential independence and labour insertion				
Rho	−0.7846***	−0.6657***	−0.8735***	−0.8655***

Note: *$p < 10\%$; **$p < 5\%$; ***$p < 1\%$.

models. In this paper, we follow the solution of Long and Mustillo (2021), who propose the use of marginal effects to compare, between different groups, the weight of the explanatory variables in the dependent variable.

Table 2 presents the marginal effects obtained with the bivariate probit model for samples related to men and women, for 2010 and 2018. The correlation coefficient between residential independence and employment (last row of table), as expected, is significantly different from zero in all the subsets analysed, indicating that there is a clear relationship between co-residence with parents and the young adult having a job.

The unexpected negative sign of this correlation coefficient shows that, for young adults in Spain, having a job does not necessarily imply a greater tendency towards residential independence. Although the negative sign is surprising, our result is in line with other studies with data on young adults in Spain which also find a negative influence of having a job on residential independence (Colom and Molés 2022; Vitali 2010). One explanation could be that there are young people who become independent without having a job, as occurs with the so-called ‘dependent independence’, that is, inactive people who become independent with a partner on whom they depend economically. It is also possible that there are young people who, despite having a job, co-reside with their parents, since working conditions do not enable them to achieve residential independence (not much job stability or low remuneration).

Residential independence

The marginal effects of the residential independence equation (top of Table 2) show that, in general, the variables that include the socio-demographic and economic characteristics of the young adult are determinant in all the groups analysed, and the effect these variables have is similar to that usually shown in previous studies (Lauster 2006; Le Blanc and Wolff 2006; Mandic 2008; Stone et al 2011).

Variables related to age, not being of Spanish nationality and the economic capacity (wage income) of the individual, are factors that increase the probability of leaving the parental home, while education negatively affects residential independence, and young people who are studying tend to remain with their parents. This result, regarding education, is similar to that obtained in previous studies using data on Spain (Ahn and Sánchez-Marcos 2017; Colom and Molés 2022; Vitali 2010).

The main differences by gender are found in the weight of the characteristics. We see that, in the two years analysed, women are more likely to become independent than men at the same age. Our results show that between 2010 and 2018 the effect of age decreases. The attained educational level barely influences men (except having university studies in 2010, which is decisive), yet it shows a notable effect in the case of women. Similarly, being a student also has more weight in the group of women. Being a foreigner has less weight in 2018, and the difference between men and women increases.

The weight of wage income is more prominent in men, and the gender differences are accentuated between 2010 and 2018. The result regarding income could show that young women in Spain sometimes opt for a ‘dependent independence’, diminishing the importance of their own income to achieve residential independence.

The variables which represent the characteristics of the housing market and the population structure show barely any effect on residential independence.

Employment

Results of the estimation of the second equation, which models whether or not the young adult has a job (bottom of Table 2), are in line with previous papers in the econometric literature (Becker et al 2010; Grigoli et al 2018). The individual’s socio-demographic and economic characteristics are significant for both men and women. Age, academic level and living with a partner, as well as residing in regions with high house prices, all have a positive effect on the probability of being employed. However, not having Spanish nationality, having children under 15 years of age and the income of other household members all reduce the probability of being employed.

There are differences by gender in the weight of these socio-demographic and economic variables. A high educational level favours having a job more for women than for men, however, having children represents a greater impediment to work for women. As has already been mentioned, women tend to leave the labour market when children come into the home and when there is income from other household members, young people are less likely to be working, and the probability of employment decreases more for women than for men. From the results obtained in 2010 and 2018, we see that the differences in the gendered effect of explanatory variables, *Descendants* and *Non-individual income,* have reduced over time. This seems to indicate that, little by little, the tendency for women to take care of the children is decreasing.

Analysis of gender gap

In this section, using decomposition techniques, the gender gap is analysed by separating the effect attributed to the observed characteristics (*endowment* effect) from the effect associated with tastes or preferences and unobserved factors (*return* effect).

We examine the gender gap in the entire distribution of the discrete outcome variable, as previously mentioned, considering the differences in all percentiles according to expression (7).

Our objective is to analyse the gender gap in the residential independence decision and in the employment decision, so first, we need to obtain, from the estimates of the bivariate probit model (Table A4 of Appendix), the marginal probability distributions of both decisions. The predicted probability of residential independence and that of employment are denoted as $\hat{p}_{iF}^{k}$ and $\hat{p}_{iE}^{k}$ and are calculated for women (represented as group $k = A$) and for men (group $k = B$). The corresponding predicted counterfactual probabilities, $\hat{p}_{iF}^{AB}$ and $\hat{p}_{iE}^{AB}$, which represent the predicted probability of women if they had the characteristics of men, are calculated following the expression (5).

The density functions of these probabilities are then obtained, as well as the corresponding cumulative distribution functions (CDF). These latter functions allow us to calculate, through expression (6), the different percentiles of each of our outcome variables ($\xi_F^A(\alpha)$, $\xi_F^B(\alpha)$, and $\xi_F^{AB}(\alpha)$ for residential independence and $\xi_E^A(\alpha)$, $\xi_E^B(\alpha)$, and $\xi_E^{AB}(\alpha)$ for employment).

It is important to note that the results are invariant when we consider men as group A and women as group B, and the counterfactual represents the predicted probability of men if they had the characteristics of women. These results are available upon request from the authors.

Residential independence

Figure 1 presents the probability density functions associated with residential independence for the years 2010 and 2018.

We see that in 2010 men present a notable percentage of the area under the density function in the lower tail, while in the group of women we find a greater concentration in the central part and the upper tail. This confirms the greater predisposition of men to co-reside with parents.

In 2018, the density functions of the residential independence of women and men show a slight move towards each other, indicating that there is a convergence in the tendency to leave the parental home between both genders. This result is in accordance with the trend observed in recent decades in Europe, possibly linked to changes in the gender role and the increase in the level of academic studies in women.

In both years, we see that the counterfactual density function resembles the density function for women. This suggests that, even if women had the same characteristics as men, not many changes would be detected in the probability of leaving the parental home, that is, the part associated with the observed characteristics does not seem to be the main reason for the gender gap.

To analyse the differences in the percentiles of the probability distribution of residential independence, we calculate the corresponding CDF for men, women, and the counterfactual, and these functions are represented in Figure 2.

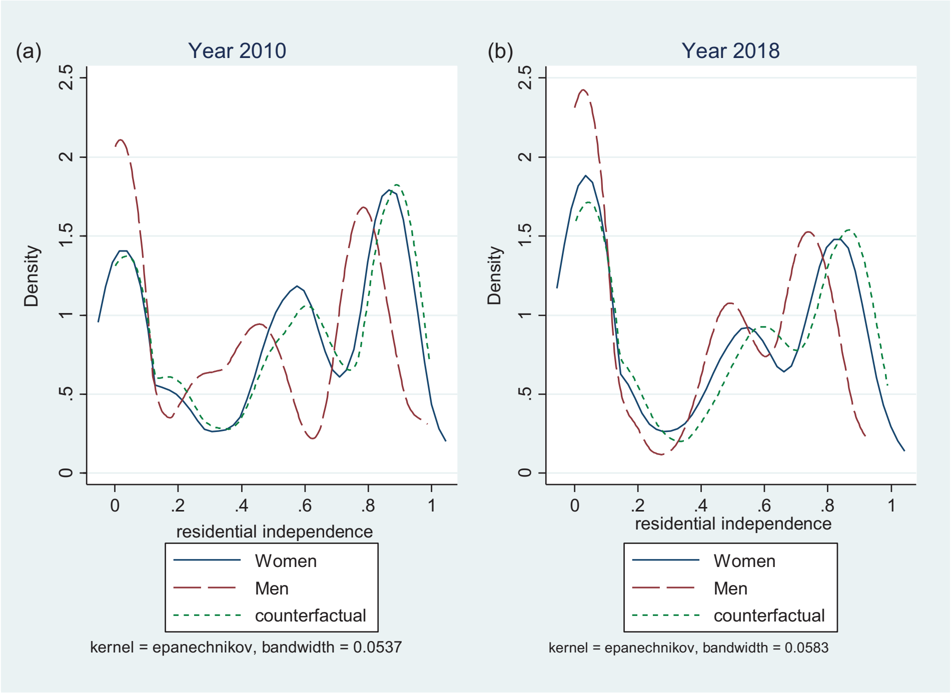

Figure 1. Probability densities of residential independence.

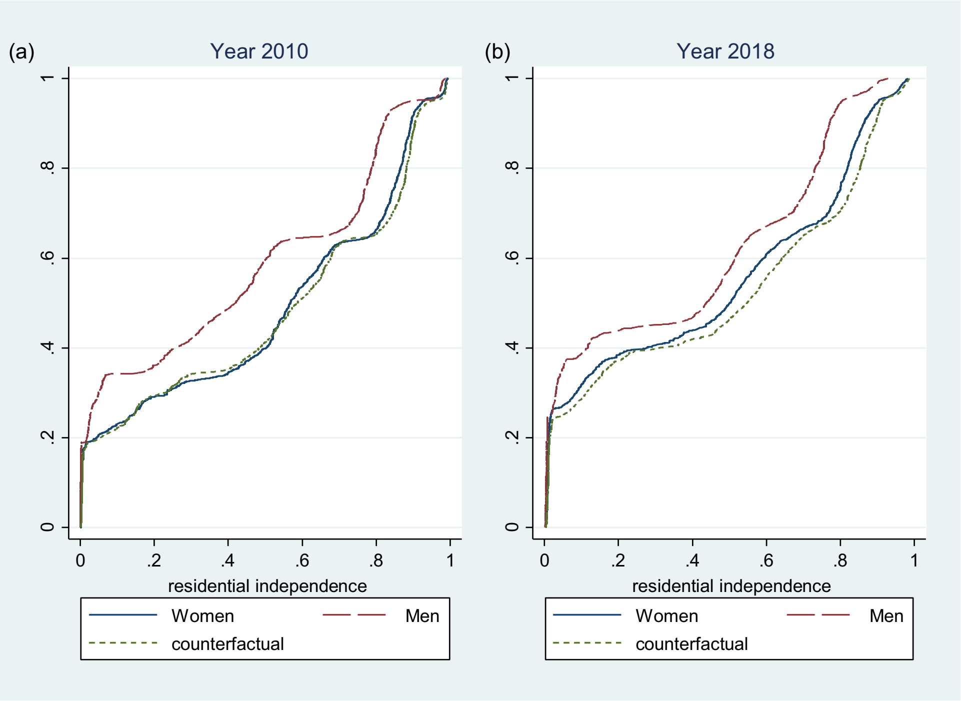

Figure 2. Cumulative distribution functions of residential independence.

Table 3. Decomposition of residential independence gender gap. Years 2010 and 2018

	2010			2018		
Percentile	Overall gap (A-B)	Endowment (A-Counterf)	Return (Counterf-B)	Overall gap (A-B)	Endowment (A-Counterf)	Return (Counterf-B)
20	0.03	0.00	0.03	0.005	−0.005	0.01
30	0.19	0.00	0.19	0.07	−0.01	0.08
40	0.25	0.01	0.24	0.10	0.00	0.10
50	0.14	−0.03	0.17	0.07	−0.03	0.10
60	0.16	−0.01	0.16	0.08	−0.04	0.12
70	0.08	−0.01	0.09	0.10	−0.02	0.12
80	0.08	−0.01	0.09	0.09	−0.03	0.12
90	0.07	−0.01	0.08	0.09	−0.02	0.11

The CDF profiles reveal that, in both years, women present higher probabilities of residential independence than men in all percentiles of the distribution; in the central percentiles are where the greatest differences between both genders are found.

For both men and women, we see that, in general, the cumulative probabilities in 2018 are reduced compared to 2010. This result may be due to the delay in the rate of residential independence with respect to the economic situation (Ahn and Sánchez-Marcos 2017). The residential independence rate continued to fall after 2010 and, although the anticipated recovery was taking place in 2018, the levels previously seen in 2010 had not yet been reached. Furthermore, this result agrees with recent papers, such as Esteve and Reher (2021), who have noted an increase on a global scale of young people living with their parents in recent years.

The drop of probability is more pronounced for women in the lower percentiles and in the central percentiles of the distribution, which has led to a narrowing of the difference in the probability of residential independence between both genders. However, in the high percentiles of the distribution, the sample of men shows a greater decrease in probability, moving further away from the sample of women.

From Figure 2, we calculate the different terms of decomposition according to expression (7), since the overall gender gap is given by the horizontal difference between the CDF of women and the CDF of men; the part of the total difference due to the observed characteristics (*endowment* effect) is obtained from the horizontal difference between the CDF of women and the counterfactual CDF, and the residual part (*return* effect) is the horizontal difference between the counterfactual CDF and the CDF of men.

Table 3 shows, for the main percentiles of the distribution, the value of the overall gap and its corresponding decomposition into the endowment and return effects. A reduction in the gender gap can be seen between 2010 and 2018 up to the 60th percentile, while from the 70th percentile there is a slight increase in the gap.

The decomposition of the overall gap, in both years, shows us that the weight of the unexplained part, or *return* effect, is greater than the weight associated with the explained part in all percentiles of the probability distribution of residential independence. For example, in 2010, we can see that at the 40th percentile, the overall gap by gender is 25 percentage points, the part due to the observed characteristics is 1 point, and the remaining 24 correspond to unobserved factors or preferences. The importance of the unobserved factors in the gender difference may be due to the fact that young women are influenced more than men by both the family background and the family structure (Blaauboer and Mulder 2010; Chiuri and Del Boca 2010).

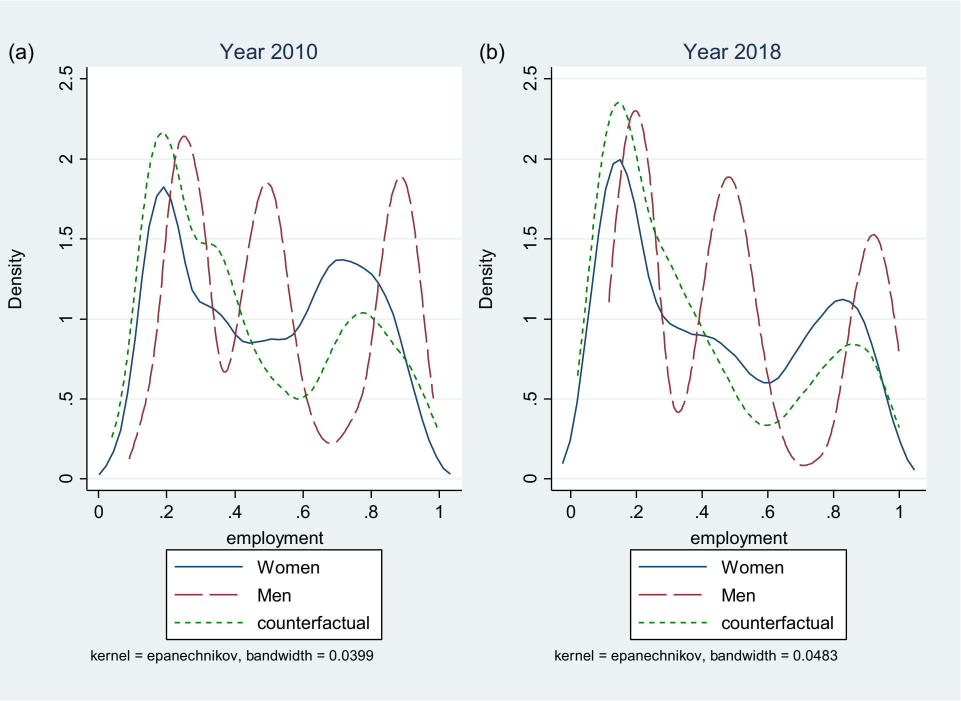

Figure 3. Probability densities of employment.

Between 2010 and 2018, there is some difference in the value of the gender gap at this rate, as Table 3 shows. What has not changed is what causes the gap, since the *return* effect associated with the unobserved factors or preferences are the ones with the greatest weight in the decomposition in both years, while the *endowment* effect or explained part still remains small. The different economic situations, periods of recession, and periods of economic growth, as well as the changes that Spanish society has experienced in recent times, could be responsible for variations in the gender gap seen in co-residence with parents.

Employment

Figure 3 shows the probability density functions associated with young people having a job for the years 2010 and 2018. Differences are visible between the group of men and the group of women. Comparing the two years analysed, we see that the profile of the density function is quite similar, although 2018 shows a decrease in young people with a high probability of being employed.

For both men and women, in both years, in the lower and upper part of the distribution there is a significant concentration of young people, although there are fewer women than men with a high probability of having a job. This may be due to the fact that some women continue with their academic studies, both university and professional training, and have not entered the labour market and others have left the labour market to start a family or to take care of the home. In the intermediate zone, women have a more uniform behaviour than men.

The counterfactual probability density function looks more like the density function of women than that of men. However, despite this similarity, there are quantitatively important differences between the counterfactual and that of women. In the lower part of

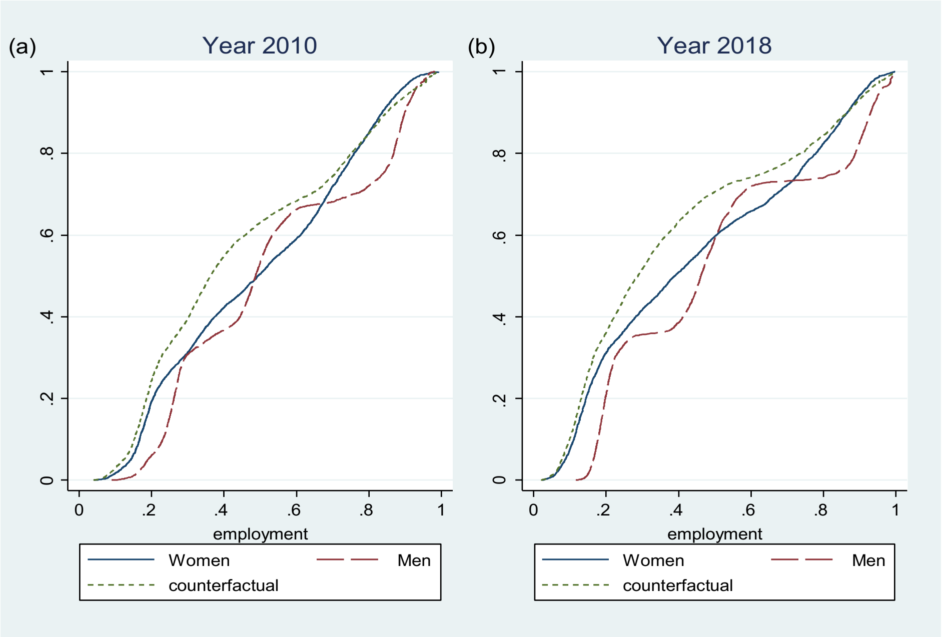

Figure 4. Cumulative distribution functions of employment.

the distribution, the counterfactual function is above that of women, while in the upper part of the distribution it is below. This suggests that the differences in the explanatory variables between both groups of young people (men and women) are indeed capable of explaining a significant part of the total gap and that the causes of the gap vary according to the percentile analysed.

Figure 4 shows the corresponding CDFs for men, women, and counterfactual, while Table 4 presents, for the main percentiles of the distribution, the overall gap and the decomposition in the explained part (*endowment* effect) and the unexplained part (*return* effect).

We see that, in both years, men are more likely than women to be working in either the low or high percentiles of the distribution. However, in the central percentiles (from 50 to 65 in 2010 and from 60 to 75 in 2018), we find that the probability of having a job is higher for women. The counterfactual CDF profile tells us that the probability of women working, if they had the same characteristics as men, would be lower than their actual probability of working.

The employment rate in 2018 decreased, for both genders, with a notable decrease in the 60th percentile. The economic recovery of that year should be reflected in an increase in the probability that young people were in employment; however, this is not what the results show. Young people, as a demographic collective, suffer the most from the deterioration of the labour market in times of economic recession, and their situation has not improved despite visible signs of an economic recovery in 2018. A possible cause of the lower employment rate is the increase in the percentage of young people who choose to continue studying. This percentage was 22% for both men and women in 2010, and in 2018 it grew to 30% and 32%, respectively (see descriptive statistics of variable *Student* in Tables A1 and A2 of the Appendix).

Between both years (2010 and 2018), we observe that, mostly, the gender gap has increased. In periods of economic crisis, in general, there is a greater destruction of those

Table 4. Decomposition of employment gender gap. Years 2010 and 2018

	2010			2018		
Percentile	Overall gap (A-B)	Endowment (A-Counterf)	Return (Counterf-B)	Overall gap (A-B)	Endowment (A-Counterf)	Return (Counterf-B)
20	−0.06	0.02	−0.09	−0.06	0.01	−0.07
30	0	0.06	−0.06	−0.03	0.02	−0.05
40	−0.08	0.07	−0.15	−0.13	0.06	−0.19
50	0.01	0.14	−0.13	−0.07	0.10	−0.17
60	0.08	0.15	−0.06	0	0.14	−0.14
70	−0.06	0.05	−0.11	0.10	0.17	−0.07
80	−0.11	0.01	−0.12	−0.11	0.04	−0.15
90	−0.06	−0.01	−0.05	−0.06	0	−0.06

jobs most typically worked by men, so men suffer more from the deterioration of the labour market and their employment rate shows a greater drop than that of women, leading to a reduction in the gender gap. However, in periods of economic boom gender differences increase (Castellano and Rocca 2018).

From Table 4 we can see that, as expected, both the *endowment* effect attributed to observed factors and the *return* effect associated with unobserved factors (tastes, preferences . . .) play an important role in explaining the employment gender gap, in either year analysed.

In the low percentiles and in the high percentiles of the distribution, where men have more probability of working than women, the weight of the unexplained part (*return* effect) is, in absolute terms, greater than the weight of the component associated with observed characteristics (*endowment* effect). In contrast, in the central percentiles in which women are more likely to have a job than men, the weight of the explained part is, in absolute terms, greater than the weight of the unexplained part. Thus, depending on the year and the analysed percentile, the predominant effect is different.

Employment for young people living independently

In this section, our objective is to analyse the gender gap in the employment rate only for young people who have become independent from their parents. This analysis aims to leave out the influence (economic as well as social and emotional) of parents on the possible incorporation of young people into the labour market. The motivation of young people to get a job is not the same if they have already become independent or if they co-reside with their parents. Coexistence with parents can interfere with the decision to work, since young people may receive financial support from their parents and, sometimes, parents may encourage their children to continue their academic studies rather than join the labour market.

The probability density functions for the years 2010 and 2018 corresponding to the employment of residentially independent young people are presented in Figure 5 and the corresponding CDFs in Figure 6. Table 5 shows the overall gap and its decomposition for the main percentiles of the distribution.

The first notable difference when the analysis is constrained to those young people who have become independent is that the values of the density functions (Figure 5) are very small in the lower tail and very large in the upper tail, a very different profile from that

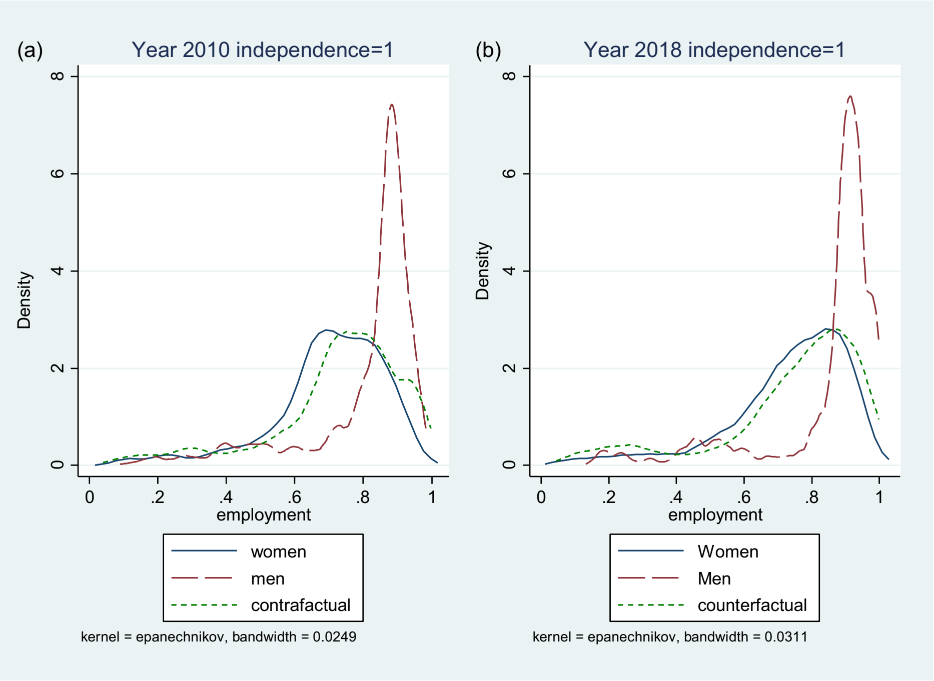

Figure 5. Probability densities of employment for independent young people.

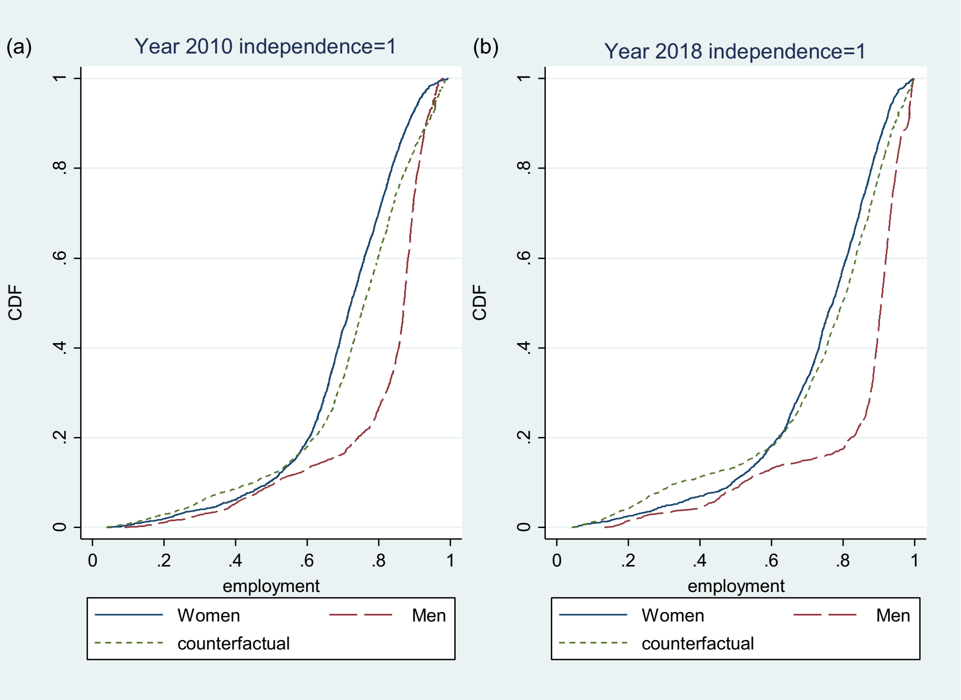

Figure 6. Cumulative distribution functions of employment for independent young people.

Table 5. Decomposition of employment gender gap for independent young people. Years 2010 and 2018

	2010			2018		
Percentile	Overall gap (A-B)	Endowment (A-Counterf)	Return (Counterf-B)	Overall gap (A-B)	Endowment (A-Counterf)	Return (Counterf-B)
20	−0.14	−0.02	−0.12	−0.21	0	−0.21
30	−0.17	−0.04	−0.13	−0.20	−0.02	−0.18
40	−0.17	−0.04	−0.13	−0.16	−0.02	−0.14
50	−0.15	−0.04	−0.11	−0.14	−0.03	−0.11
60	−0.12	−0.04	−0.08	−0.11	−0.02	−0.09
70	−0.09	−0.03	−0.06	−0.08	−0.02	−0.06
80	−0.07	−0.03	−0.04	−0.07	−0.03	−0.04
90	−0.05	−0.06	0.01	−0.06	−0.03	−0.03

shown in Figure 3 which includes all young people. We also detect that the difference between men and women in the probability of having a job is accentuated.

In the group of independent young people, the counterfactual density function is much closer to the probability density function of women than in the previous section.

From the CDFs shown in Figure 6, we see that the independent young adults present higher probability values than those associated with all young people. At the 10th percentile, the probability of working is greater than 50% in both genders, and in the particular case of men, at the 20th percentile, the probability is already greater than 75%. Also, men are seen to present higher probability values than women in all percentiles of the employment distribution, leading to the differences between men and women being considerably larger than those found in the analysis of all the young people, and always in favour of men.

The temporal comparison shows that the gender gap increases between 2010 and 2018 for those young people with fewer possibilities of having a job (approximately up to the 30th percentile), while from the 40th percentile a slight decrease in the gender difference is observed.

In addition, the results of the decomposition (Table 5) indicate that for those young people who are independent, both the *endowment* effect and *return* effect have a notable weight in gap decomposition. That is, both the observed characteristics and the unobserved characteristics are responsible for the overall gap, but with different weights according to the percentile being analysed. In general, the effect associated with unobserved factors (*return* effect) is the one that has the greatest weight in the gender differences in all percentiles. However, the weight of both components (*endowment* and *return*) is approaching in the highest percentiles. In 2010, the contribution of the residual component, or *return* effect, at the 90th percentile is practically zero.

Conclusions

Using a bivariate probit model, this study analyses the determinants for young adults in Spain on whether to seek residential independence and employment, and the results point to a notable correlation between both these decisions.

Results show that the effect of the main determinants, both on the decision of young people to leave the parental home and on the decision to join the labour market, varies between men and women. Between the year 2010, in which there were signs of a recession, and the year 2018, associated with a period of economic recovery, no remarkable differences could be seen.

The decomposition technique used to analyse the gender gap is an adaptation of the Machado-Mata method for discrete outcome variables. This adaptation enables us to perform the decomposition of differences between men and women throughout the probability distribution.

Findings indicate that, among young adults in Spain, women have a higher rate of residential independence than men. A possible cause could be that, for women, late residential independence means a delay in the formation of a family and motherhood, as has already been argued in previous studies for European countries (Chiuri and Del Boca 2010). Our study also highlights that, over time, there is a convergence in the rate of residential independence between young men and women in Spain, in accordance with the trend observed in recent decades in Europe.

In the decomposition of the differences between men and women in the rate of residential independence, we show that it is the unobserved factors (*return* effect) that have the greatest weight on the gender gap. As in most Mediterranean countries, the weight of unobserved traditional socio-cultural factors regarding the concept of family or the role of women in the home seems to be more significant for young women in Spain than for men when it comes to residential independence.

The analysis shows the existence of differences in the employment rate between young men and women, with men, in general, having the highest employment rate, especially among young people living independently. The decomposition results indicate that both observed and unobserved factors are responsible for the gender difference in the employment rate, although its weight varies according to the moment in time and to the percentile analysed.

Unobserved factors have been found to play a notable role in the employment gender gap, especially in the group of young adults living independently. Aspects such as occupational segregation or stereotypes or the lack of real equality of opportunities are likely still linked to the lower opportunity cost that leaving the labour market means for women.

Recent advances in gender equality in labour policies in Spain may have led to a more active attitude among the cohorts of young women entering the labour market. As our analysis shows for the group of young people who live independently, there is a slight decrease in the gender gap in the employment rate between the two periods analysed.

One recommendation would be to promote policies that further improve the conciliation of family and work life. This could reduce female labour abandonment associated with aspects viewed as crucial by young women (such as starting a family or motherhood), reducing the gender gap in the labour market. In addition, this may help reduce inequality in the distribution of domestic tasks.

Data availability statement. The data that support the findings of this study are available in https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176806&menu=ultiDatos&idp=1254735976608.

Funding statement. There are no funders to report for this submission.

Competing interests. No potential or perceived conflicts of interest.

Note

1 The random disturbances collect the unobservable factors involved in the two decisions, so υ_F and υ_E may be correlated.

References

Aassve A, Billari FC, Mazzuco S and Ongaro F (2002) Leaving home: A comparative analysis of ECHP data. *Journal of European Social Policy* 12(4), 259–275. https://doi.org/10.1177/a028430

Aassve A, Arpino B and Billari FC (2013) Age norms on leaving home: Multilevel evidence from the European Social Survey. *Environment and Planning A* 45, 383–401. https://doi.org/10.1068/a4563

Ahn N and Sánchez-Marcos V (2017) Emancipation under the great recession in Spain. *Review of Economics of the Household* 15(2), 477–495. https://doi.org/10.1007/s11150-015-9316-7

Alawad A, Kreihan F and Selim M (2020) Determinants of youth unemployment: Evidence from Jordan. *International Journal of Economics and Business Administration* 4(VIII), 152–165. https://doi.org/10.35808/ijeba/576

Antecol H (2000) An examination of cross-country differences in the gender gap in labor force participation rates. *Labour Economics* 7, 409–426. https://doi.org/10.1016/S0927-5371(00)00007-5

Aparicio-Fenoll A and Oppedisano V (2015) Fostering household formation: Evidence from a Spanish rental subsidy. *The B. E. Journal of Economic Analysis & Policy* 15(1), 53–84. https://doi.org/10.1515/bejeap-2014-0003

Banerjee M (2019) Gender equality and labour force participation: Mind the gap. *Antyajaa: Indian Journal of Women and Social Change* 4(1), 113–123. https://doi.org/10.1177/2455632719831827

Bayrak R and Tatli H (2018) The determinants of youth unemployment: A panel data analysis of OECD countries. *The European Journal of Comparative Economics* 15(2), 231–248. https://doi.org/10.25428/1824-2979/201802-231-248

Becker SO, Bentolila S, Fernandes A and Ichino A (2010) Youth emancipation and perceived job insecurity of parents and children. *Journal of Population Economics* 23, 1175–1199. https://doi.org/10.1177/s00148-008-0224-5

Bell NF and Blanchflower DG (2011) Young people and the great recession. *Oxford Review of Economic Policy* 25(2), 241–267. https://doi.org/10.1093/oxrep/grr011

Billari FC and Liefbroer AC (2010) Towards a new pattern of transition to adulthood? *Advances in Life Course Research* 15, 59–75. https://doi.org/10.1016/j.alcr.2010.10.003

Blaauboer M and Mulder CH (2010) Gender differences in the impact of family background on leaving the parental home. *Journal of Housing and the Built Environment* 25(1), 53–71. https://doi.org/10.1007/s10901-009-9166-9

Blinder A (1973) Wage discrimination: reduced form and structural estimates. *Journal of Human Resources* 8(4), 436–455. https://doi.org/10.2307/144855

Castellano R and Rocca A (2018) Gender disparities in European labour markets: A comparison of conditions for men and women in paid employment. *International Labour Review* 154(4), 589–608. https://doi.org/10.1111/ilr.12122

Chiuri M and Del Boca D (2010) Home-leaving decisions of daughters and sons. *Review of Economics of the Household* 8(3), 393–408. https://doi.org/10.1007/s11150-010-9093-2

Colom MC and Molés MC (2022) Housing tenure of young people through a multilevel strategy: differences according to living arrangements. *International Journal of Urban Sciences* 26(2), 268–290. https://doi.org/10.1080/12265934.2021.1911675

Cooper D and Luengo-Prado MJ (2018) Household formation over time: Evidence from two cohorts of young adults. *Journal of Housing Economics* 41, 106–123. https://doi.org/10.1016/j.jhe.2018.06.002

Coulson NE and Dalton M (2010) Temporal and ethnic decompositions of homeownership rates: Synthetic cohorts across five censuses. *Journal of Housing Economics* 19, 155–166. https://doi.org/10.1016/j.jhe.2010.03.001

DiNardo J, Fortin NM and Lemieux T (1996) Labor market institutions and the distribution of wages. 1973–1992: A semiparametric approach. *Econometrica* 64, 1001–1044. https://doi.org/10.2307/2171954

Dueñas D, Iglesias C and Llorente R (2014) Occupational segregation by sex in Spain: Exclusion or confinement? *International Labour Review* 153(2), 311–336. https://doi.org/10.1111/j.1564-913X.2014.00206.x

Ermisch J (1999) Prices, parents, and young people's household formation. *Journal of Urban Economics* 45(1), 47–71. https://doi.org/10.1006/juec.1998.2083

Esteve A and Reher DS (2021) Rising global levels of intergenerational coresidence among young adults. *Population and Development Review* 47(3), 691–717. https://doi.org/10.1111/padr.12427

Fairlie RW (2005) An extension of the Blinder-Oaxaca decomposition technique to logit and probit models. *Journal of Economic and Social Measurement* 30(873), 305–316. https://doi.org/10.3233/JEM-2005-0259

Fesselmeyer E, Le KT and Seah KY (2012) A household-level decomposition of the white–black homeownership gap. *Regional Science and Urban Economics* 42, 52–62. https://doi.org/10.1016/j.regsciurbeco.2011.05.002

Fitzenberger B, Schnabel R and Wunderlich G (2004) The gender gap in labor market participation and employment: A cohort analysis for West Germany. *Journal of Population Economics* 17, 83–116. https://doi.org/10.1007/s00148-003-0141-6

Grigoli F, Koczan Z and Topalova P (2018) Drivers of labor force participation in advanced economies: Macro and micro evidence. International Monetary Fund WP/18/150. https://doi.org/10.5089/9781484361528.001

Kalb G, Le T, Hunter B and Leung F (2012) Decomposing differences in labour force status between indigenous and non-indigenous Australians. *IZA Discussion Paper No. 6808*. https://doi.org/10.2139/ssrn.2157950

Lauster NT (2006) A room of one's own or room enough for two? Access to housing and new household formation in Sweden, 1968–1992. *Population Research and Policy Review* 25(4), 329–351. https://doi.org/10.1007/s11113-006-9000-y

Le Blanc D and Wolff FC (2006) Leaving home in Europe: The role of parents' and children's incomes. *Review of Economics of the Household* 4, 53–73. https://doi.org/10.1007/s11150-005-6697-z

Long JS and Mustillo SA (2021) Using predictions and marginal effects to compare groups in regression models for binary outcomes. *Sociological Methods and Research* 50(3), 1284–1320. https://doi.org/10.1177/0049124118799374

Machado JA and Mata J (2005) Counterfactual decomposition of changes in wage distributions using quantile regression. *Journal of Applied Econometrics* 20, 445–465. https://doi.org/10.1002/jae.788

Mandic S (2008) Home-leaving and its structural determinants in Western and Eastern Europe: An exploratory study. *Housing Studies* 23(4), 615–636. https://doi.org/10.1080/02673030802112754

Mulder CH, Clark WAV and Wagner M (2002) A comparative analysis of leaving home in the United States, The Netherlands & West Germany. *Demographic Research* 7, 565–592. https://doi.org/10.4054/DemRes.2002.7.17

Oaxaca R (1973) Male-female wage differentials in urban labor markets. *International Economic Review* 14(3), 693–709. https://doi.org/10.2307/2525981

Stone J, Berrington A and Falkingham J (2011) The changing determinants of UK young adults' living arrangements. *Demographic Research* 25, 629–666. https://doi.org/10.4054/DemRes.2011.25.20

Vitali A (2010) Regional differences in young Spaniards' living arrangement decisions: A multilevel approach. *Advances in Life Course Research* 15(3), 97–108. https://doi.org/10.1016/j.alcr.2010.04.003

Appendix

Table A1. Summary statistics. Year 2010

	Women		Men	
	Mean	Stand. Dev.	Mean	Stand. Dev.
Dependent Variables				
Independence	0.50	0.500	0.38	0.485
Employment	0.51	0.500	0.55	0.498
Individual Variables				
Age	27.10	5.375	26.67	5.361
Primary[a]	0.31	0.463	0.43	0.495
Secondary	0.30	0.460	0.29	0.456
University	0.39	0.487	0.28	0.448
Student	0.22	0.417	0.22	0.414
Foreign	0.14	0.351	0.12	0.328
Couple	0.43	0.495	0.30	0.460
Descendants	0.30	0.460	0.19	0.392
Individual Income	556.89	618.940	677.82	692.354
Non-Individual Income	1722.50	1232.819	1702.30	1394.588

Table A2. Summary statistics. Year 2018

	Women		Men	
	Mean	Stand. Dev.	Mean	Stand. Dev.
Dependent Variables				
Independence	0.42	0.493	0.31	0.464
Employment	0.46	0.499	0.54	0.499
Individual Variables				
Age	26.59	5.455	26.34	5.420
Primary[a]	0.24	0.427	0.34	0.473
Secondary	0.46	0.499	0.47	0.499
University	0.30	0.458	0.19	0.393
Student	0.32	0.468	0.30	0.458
Foreign	0.15	0.353	0.12	0.326
Couple	0.34	0.475	0.24	0.425
Descendants	0.23	0.424	0.14	0.344
Individual Income	516.42	617.262	627.70	691.463
Non-Individual Income	1951.40	1506.882	1937.40	1562.201

Table A3. Summary statistics of regional variables

	2010		2018	
	Mean	Stand. Dev.	Mean	Stand. Dev.
Price	1767.80	478.976	1484.38	535.587
Rural	15.36	11.422	14.68	10.971

Table A4. Estimates of residential independence and employment model

	2010		2018	
	Women	Men	Women	Men
Residential independence				
Intercept	−2.2832***	−2.0800***	−1.5978**	−1.3525**
Age24	0.4129***	0.3853***	0.1376*	−0.1989***
Age30	1.2087***	1.2069***	0.8551***	0.4683***
Secondary	−0.1294*	−0.0542	−0.2435***	0.0052
University	−0.4353***	−0.2061***	−0.4477***	−0.0722

(*Continued*)

Table A4. (*Continued*)

	2010		2018	
	Women	Men	Women	Men
Student	−1.5120***	−1.1762***	−1.1491***	−0.8507***
Foreign	1.0725***	1.1644***	0.8135***	0.5718***
Individual income	0.1544***	0.2238***	0.1920***	0.2645***
Price	0.1751**	0.0290	0.0830	−0.0323
Rural	−0.0008	−0.0039*	0.0029	−0.0056**
Employment				
Intercept	−3.7201***	−2.3912***	−2.6648***	−1.5856***
Age24	0.5020***	0.5975***	0.6605***	0.7967***
Age30	0.3664***	0.5586***	0.4776***	0.6787***
Secondary	0.4260***	0.3110***	0.2832***	0.0161
University	0.8410***	0.5183***	0.6287***	0.2420***
Foreign	−0.3084***	−0.2884***	−0.4365***	−0.1322**
Couple	1.1985***	1.2288***	1.4686***	1.5001***
Descendants	−0.2908***	−0.0970	−0.2948***	−0.1897**
Non-individual income	−0.1831***	−0.0892***	−0.1844***	−0.1426***
Price	0.5003***	0.2727***	0.3743***	0.2420***
Rural	0.0052***	0.0052***	0.0027	0.0035

Note: *$p < 10\%$; **$p < 5\%$; ***$p < 1\%$.

M. Consuelo Colom Andrés is a professor and researcher in Department of Applied Economics, the University of Valencia (Spain). Her lines of research include the housing market, youth, immigration and statistical techniques applied to the field of economic statistics. She has collaborated on research projects with the Valencian Institute of Statistics. The most recent publications deal with youth and their problems over transition to adulthood, where multilevel models or qualitative response models have been applied.

M. Cruz Molés Machí is professor in University of Valencia (Spain) in the area of Quantitative Methods, teaching mainly statistics and data analysis. She is researcher at in Department of Applied Economics. Her research interests are in the fields of labor market, the housing market, immigration, youth and statistical techniques involving the estimation of parameters for small sub-populations (Small area estimation) and decomposition techniques. She has published peer-reviewed articles in various social sciences and economics journals.

Cite this article: Colom Andrés MC and Molés Machí MC (2024). Gender gap in residential independence and employment of young people. *The Economic and Labour Relations Review* **35**, 140–162. https://doi.org/10.1017/elr.2024.2