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Lost in Recession: Youth Employment and Earnings in Spain

Samuel Bentolila
(CEMFI)

Florentino Felgueroso
(Fedea)

Marcel Jansen
(UAM y Fedea)

Juan F. Jimeno
(Banco de España y Universidad de Alcalá)

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fedea

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Resumen

La actual generación de jóvenes se enfrenta a retos excepcionales, tras sufrir el impacto de dos crisis económicas profundas en poco más de una década. En el caso de España este reto es aún mayor debido a problemas estructurales en el mercado de trabajo que perjudican especialmente a los jóvenes, dificultando su acceso a empleos estables. Motivado por estos hechos, el presente estudio analiza la evolución de las condiciones laborales de los jóvenes durante los últimos treinta años y documenta su continuo deterioro. En cada recesión se produce un retroceso en la situación laboral de los jóvenes. Los principales afectados son quienes terminan sus estudios durante estas recesiones, que sufren impactos negativos sobre su empleo y sus salarios no solo al entrar en el mercado de trabajo sino también durante un buen número de años de su carrera profesional. En otras palabras, les quedan cicatrices, por lo que este fenómeno se conoce como el “efecto cicatriz de las recesiones”. Sin embargo, el principal resultado de este estudio es la falta de una recuperación completa de las condiciones laborales que tienen los jóvenes al inicio de una recesión durante la siguiente expansión, en particular, los días medios trabajados y los ingresos laborales correspondientes. Es decir, que una parte considerable del deterioro sufrido en las recesiones se consolida, provocando una tendencia negativa en las condiciones iniciales de empleo de cada cohorte siguiente de jóvenes en España.

El estudio se divide en tres partes. La primera parte ofrece una panorámica de las principales tendencias del mercado de trabajo de los jóvenes usando datos procedentes de la Encuesta de Población Activa (EPA) y la Muestra Continua de Vidas Laborales (MVCL). Esta segunda fuente incluye el historial laboral de una muestra representativa del 4% de los cotizantes a la Seguridad Social. Aparte de hechos ya conocidos, como la alta volatilidad cíclica del paro juvenil y la alta proporción de contratos temporales, los datos muestran la delicada situación de los jóvenes al principio de la actual pandemia, con tasas de paro que duplican las existentes al principio de la Gran Recesión de 2008-2013. Sin embargo, el hecho más destacable es la senda negativa de los ingresos salariales de los jóvenes. En 2019, la mediana del salario mensual real de los jóvenes entre 18 y 35 años era menor que en 1980, con caídas que van desde el 26% para aquellos con edades entre 30 y 34 años hasta el 50% para los de 18 a 20 años. Estas caídas se deben principalmente a una reducción muy acusada de la duración de sus empleos y a un aumento del peso del empleo a tiempo parcial. El impacto conjunto supone caídas de la media de los días de trabajo equivalentes a tiempo completo del 73% al 22%, respectivamente, debido a la caída de la duración de los contratos y de la jornada laboral.

Para entender mejor estas tendencias, en la segunda parte se presenta un análisis al nivel de las cohortes empleando datos longitudinales de la MCVL. Al igual que la mayoría de los estudios sobre los efectos cicatriz de las recesiones, este análisis se limita a los jóvenes con estudios universitarios a los que se divide en función de su titulación: diplomatura, grado y posgrado. Los principales resultados confirman las tendencias identificadas en la primera parte. En particular, durante las recesiones se observa una fuerte caída de la renta laboral media de los jóvenes durante su primer año en el mercado de trabajo. Además, las cohortes

que entran en los años posteriores a cada recesión lo hacen en condiciones similares o incluso peores. El resultado es una caída tendencial en la renta salarial durante el primer año de experiencia laboral y lo más llamativo es que se producen patrones similares, aunque menos acusados, hasta los 15 años de experiencia laboral, lo que sugiere que el deterioro de las condiciones de entrada tiene efectos persistentes durante buena parte de las carreras laborales.

En la tercera y última parte se lleva a cabo un intento de medir la persistencia de las condiciones de entrada en el mercado. En el análisis empírico se utiliza la variación al nivel de la cohorte de la tasa de paro provincial y del año de graduación, para estimar en qué medida condiciones desfavorables en el momento de la entrada al mercado de trabajo condicionan el progreso de los resultados laborales en los años posteriores. Este análisis es estándar en la literatura sobre el efecto cicatriz de las recesiones. Sin embargo, una de las novedades de este estudio es que también se permite que exista una senda temporal diferente para cada nivel de experiencia laboral (interactuando una tendencia con “efectos fijos” de experiencia potencial). Esto permite captar el impacto de cambios estructurales en el mercado de trabajo –que pueden ser cambios de la oferta o la demanda de universitarios o de los aspectos institucionales– sobre los resultados laborales de los jóvenes durante sus primeros diez años en el mercado.

Los resultados obtenidos confirman la importancia de las condiciones iniciales. En la especificación de referencia para quienes terminan un grado universitario, una subida de un punto porcentual de la tasa de paro provincial en el año de entrada está asociada con una caída de la renta salarial mensual de 1,5 puntos porcentuales dos años después. Y el efecto solo deja de ser significativo a partir del séptimo año. A modo de ejemplo, estas cifras implican que el universitario medio graduado en 2013 en la provincia con la menor tasa de paro en 2007 (Guipúzcoa) obtendría dos años más tarde una renta mensual un 13,5% más baja que la de alguien que hubiera entrado en 2007, mientras que la pérdida correspondiente a la provincia con la mayor tasa de desempleo (Jaén) hubiera sido cercana al 40%. No obstante, estos efectos estimados son algo menores que en la mayoría de los estudios existentes y desaparecen casi completamente al introducir como factores explicativos los cambios estructurales (la senda temporal antes mencionada), niveles medios distintos para cada cohorte y la tasa de paro nacional contemporánea. Por el contrario, los efectos de la senda temporal para cada nivel de experiencia son grandes y estadísticamente significativos. En concreto, comparando a dos individuos que se gradúan con diez años de diferencia en la misma provincia y con la misma tasa de paro provincial, el salario diario medio y el número de días trabajados durante el primer año serían respectivamente un 7% y un 9,3% más bajos para la persona que entra más tarde. Por tanto, al considerar un período de tiempo suficientemente largo, pesa más el año de entrada al mercado de trabajo que la tasa de paro en el momento de la graduación.

Se deja para la investigación futura el estudio de las causas del continuo deterioro de las condiciones laborales iniciales de los jóvenes. Una posible causa es la introducción de reformas laborales durante las recesiones que flexibilizan la contratación y/o el despido de los jóvenes y que acaban precarizando aún más su empleo. Sin embargo, tampoco hay que

descartar la importancia de los desajustes entre la oferta y la demanda de cualificaciones debido al progreso tecnológico y el poco peso de las disciplinas STEM (ciencia, tecnología, ingeniería y matemáticas) en nuestro país.

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Samuel Bentolila
CEMFI

Florentino Felgueroso
Fedea

Marcel Jansen
Universidad Autónoma de Madrid

Juan F. Jimeno
Banco de España and Universidad de Alcalá

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Abstract

Young workers in Spain face the unprecedented impact of the Great Recession and the Covid-19 crisis in short sequence. Moreover, they have also experienced a deterioration in their employment and earnings over the last three decades. In this paper we document this evolution and adopt a longitudinal approach to show that employment and earnings losses suffered by young workers during recessions are not made up in the subsequent expansions. We also estimate the size of the scarring effects of entering the job market in a recession for college-educated workers during their first decade in the labor market. Our empirical estimates indicate that, while there is some evidence of scarring effects, the driving force is a trend worsening of youth labor market outcomes.

Key words: youth, employment, earnings, scarring effects.
JEL codes: J13, J24, J31.

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1. Introduction

Spanish youth face a tremendous challenge. Their welfare was severely hit by the Great Recession (2008-2013) and they are now battered by the recession caused by the Covid-19 pandemic that started in 2020, which is beating them especially hard. This is a matter of the utmost importance for the Spanish society.

Moreover, this is not a new situation. The Spanish labor market is a hostile environment for young workers. “No country for young people”, in the apt expression of Juan J. Dolado, a great economist, a close friend of ours, and a movie buff. A couple of figures make this evident. Over the period 1983-2019, the average unemployment rate for workers aged 20-24 years old was equal to 32.7% and for those aged 25-29 years old it was equal to 22.3%. In contrast, in the (then) European Union of 28 countries (EU-28), the corresponding averages were, respectively, 17.8% and 11.5%, in other words, about half the size of the rates in Spain.

And this is not simply the result of the overall unemployment rate being significantly higher in Spain than in the rest of Europe. Young Spaniards suffer on every front: they have very low employment rates, very high rates of temporary employment with a corresponding huge job churn, and low wages.

The economic analysis of the causes of low employment rates and high unemployment rates among young workers can be divided into two strands of research. The first one studies the relevance of education, labor market institutions, and employment policies on the transition from school to work to the determination of structural unemployment. A second strand of research analyzes the cyclical behavior of youth unemployment and the scarring effects of entering the labor market during recessions.

In line with this dichotomy, the problems for young workers’ transition from school to work in Spain are found on two fronts. The first one is education, with key aspects like the levels of attainment, the composition by disciplines or its quality. In this regard, Spain suffers from a high dropout rate –which was especially high during the expansion that preceded the Great Recession– and at the same time a relatively high share of university graduates (mostly in Law, Humanities, and Social Sciences) and a low share of upper secondary education, mostly due to a shortfall in vocational education and training. The second front is related to labor market institutions, which strongly worsen the employment opportunities of new entrants. With an entrenched dual configuration, employment protection legislation and the structure of collective bargaining create a strong insider-outsider divide that place a significant burden on youths (Bentolila et al. 2012, 2020, Felgueroso et al. 2019).

Beyond the structural causes of youth unemployment and the long-run trends affecting this segment of the labor market –i.e., demographics, technology, and human capital accumulation– the current cohorts of young workers have been very negatively affected by two deep recessions taking place in short sequence. Indeed, the economic impacts of both the Great Recession and the Covid-19 crisis have been particularly acute in comparison with the rest of Europe. The former was associated with the bursting of a housing bubble and the subsequent downsizing of the construction sector –where many school dropouts were employed– and the latter has strongly reduced employment opportunities in the service sector –in which job entry ports for young people were

overrepresented. Thus, we should expect the scars from entering the labor market in a recession to be deeper for the current cohorts of young Spaniards than for their European counterparts.

There is a small but growing literature on the *scarring effects* of recessions. Most studies focus on university graduates and base their empirical strategy on the seminal contribution of Oreopolous et al. (2012) for the case of Canada. This study exploits the variation across cohorts and provinces in the unemployment rate to study how the labor market conditions at graduation condition entrants' experience profiles of earnings and employment. In the case of the US there are several studies that point at substantial scarring effects using a similar setup (e.g., Kahn 2010, Altonji et al. 2016, Schwandt and von Wachter 2019 or Rothstein 2020). According to these studies a deep recession causes a drop in initial earnings of close to 10%, with estimated semi-elasticities of earnings with respect to the unemployment rate in a range between 2 and 3. The negative effects remain significant up to seven years after entry. In most studies, the drop in initial earnings is attributed above all to a fall in the number of days of work along with a drop in the quality of the entrants' first job. Indeed, mobility to other jobs is a key mechanism behind the gradual recovery of earnings, especially in the first years after entry. By contrast, in later years, convergence in earnings mainly takes place through wage growth at the same employer. Furthermore, the studies for the US and Canada point at substantial variety in the strength of the scarring effects by field of study, college attended, and type of program. In general, the scarring effects are weaker and less persistent for individuals with the highest predicted level of future earnings. Besides earnings and employment, recent studies have also considered outcome variables such as household income, access to welfare payments or poverty. Finally, two studies (Altonji et al. 2016 and Rothstein 2020) document much larger losses for individuals who entered the US labor market during or after the Great Recession. Altonji et al. (2016) attribute this trend break, which both studies date around 2005, to a rise in the cyclical sensitivity of the employment of college graduates.

Apart from Canada and the US, evidence on the scarring effects of recessions is available for a range of countries.¹ As for Spain, Fernández-Kranz and Rodríguez-Planas (2017) use Social Security records that cover the period 1980-2008 to analyze the scarring effects from recessions for males at all levels of education, using a setup based on Kahn (2010). In this simplified setup, the initial unemployment rate is interacted with a continuous variable that measures entrants' potential experience rather than cohort fixed effects as in Oreopolous et al. (2012). According to their findings, the negative effects from entry in recessions fall with the educational attainment of entrants. In particular, for high school graduates they obtain initial earnings losses in deep recessions of 25%, that drop to 3% after 10 years. By contrast, for university graduates the initial impact is half as big and the penalty ceases to be significant after five years.

Our paper offers various contributions to the analysis of youth employment and earnings of young Spaniards. First of all, our sample period spans the period 1987-2019. Hence, our estimation includes the cohorts that entered during the Great Recession. Furthermore, while our empirical strategy is closer to the one developed by Oreopoulos et al. (2012), we pay more attention to the relative relevance of both the initial labor market conditions

¹ The list of countries includes Australia (Andrews et al. 2020), Austria (Brunner and Kuhn 2014), Belgium (Cockx and Girelli 2015), Germany (Arellano-Bover 2020), Japan (Genda, Kondo, and Ohta 2010) and Norway (Raaum and Roed 2006).

at graduation and the actual year of entry. This issue is key because inspection of the data reveals a clear negative trend in the initial labor market outcomes of university graduates in Spain. To be more precise, in recessions we observe a steep deterioration in the initial outcomes of graduates, but in the subsequent recovery the initial conditions for later cohorts do not recover their pre-recession levels. In other words, a substantial share of the deterioration in labor market outcomes of graduates in recessions is consolidated, causing a trend decline in the initial conditions of university graduates.

The rest of this paper is organized as follows. We start by documenting in Section 2 the trend deterioration experienced in the labor market for youths in Spain over the last three decades, focusing on aggregate youth unemployment and employment rates, and temporary and part-time employment rates; and discuss developments in education and in the days worked and earnings of young workers. Then in Section 3 we adopt a cohort approach and show, over the same period, the longitudinal evolution of employment and earnings of young workers from job market entry onwards, finding that losses suffered during recessions are not made up in the subsequent expansion. In Section 4 we estimate the size of scarring effects. We trace how the state of the labor market at the graduation dates affects the employment and earnings of young workers during their first decade in the labor market. We find that, while there is some evidence of scarring effects, the overriding force appears to be a trend worsening of youth labor market outcomes. In Section 5 we summarize the conclusions from our analysis.

2. The Spanish youth labor market: An overview

There are well-known reasons why young workers suffer higher unemployment rates and earn lower wages than adult workers. Young workers are more mobile, have lower job experience, and, after transiting from school to work, are more likely to enter into job matches that are of lower duration and less adequate to their professional skills. Typically, as working life proceeds, workers settle down into significant and stable jobs, where experience, earnings, and job stability improve, resulting in better labor market outcomes.

However, even after taking these factors into account, the Spanish labor market for youths shows a dismal performance.² Three facts are striking. The first one is that differences between the labor market outcomes of young and adult workers are huge in comparison to most European countries. The second one is that over the last four decades, the labor market outcomes of Spanish youths have significantly worsened. Lastly, the speed at which young workers enter into more stable and rewarding employment spells is extremely low. What follows is a brief overview that documents these three facts.

To start our discussion, Figure 1 shows unemployment rates by age group in Spain and the EU-28 from 1983 to 2020. During this period, unemployment rates in Spain fluctuated around an average of 32.7% for the 20-24 year olds, 22.3% for the 25-29 year olds, and 13.1% for the 30-64 year olds.³ In contrast, in the EU-28 the corresponding averages were, respectively, 17.8%, 11.5% and 7.1%. Thus, the gaps between young and adult workers' average unemployment rates in Spain almost double the ones observed in the EU-28, e.g., 19.6 % in Spain vs. 10.7% for the 20-24 year olds vis-à-vis the 30-64 year

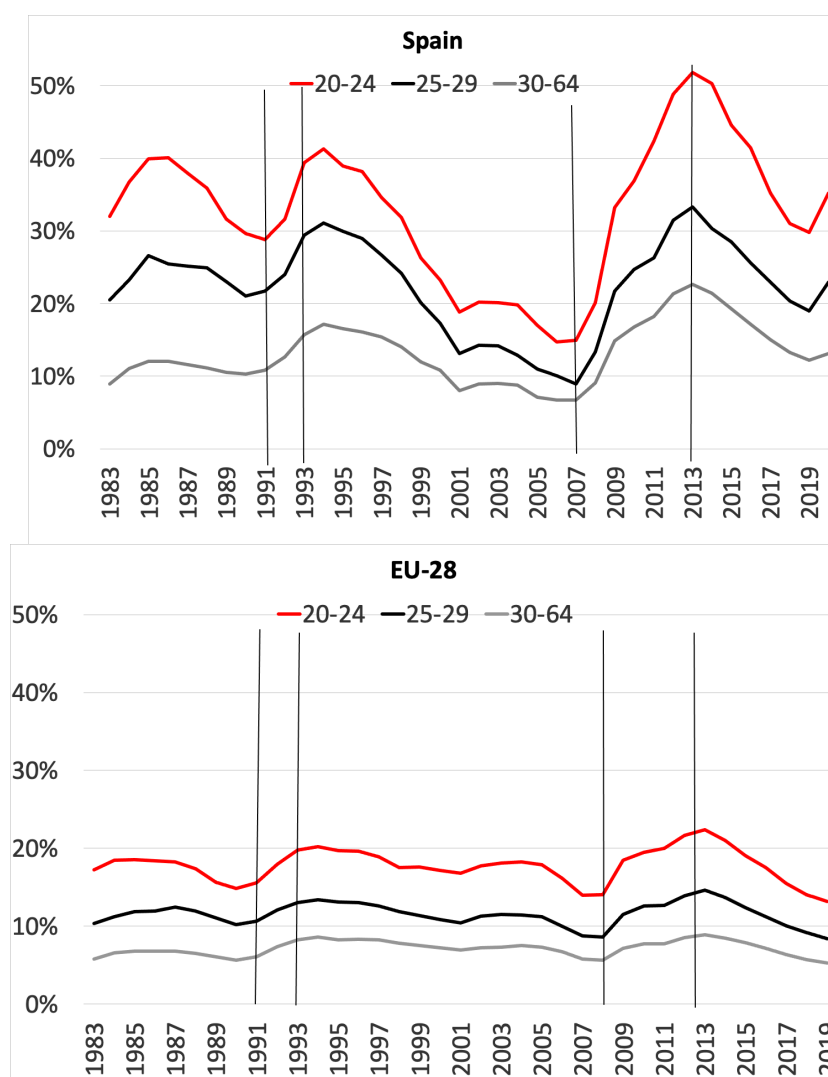
² For a comparison across European countries see Dolado (2015).

³ We informally use an extended definition of youth, going up to 29 years old, as opposed to the standard definition that stops at 24 years old.

olds.⁴ It is also worth noting that the rises in unemployment rates in recessions (shaded areas in the figure) are much more pronounced in Spain for young workers than for adult workers, while in the EU-28 the unemployment rates for different age groups move more or less in parallel. For instance, while the gap in unemployment rates of the 20-24 year olds with respect to 30-64 year olds in 2007 was the same in the EU-28 and Spain, 8.2 percentage points (pp), by 2013 it had increased to 13.4 pp in the EU-28 and a whopping 29 pp in Spain.

As indicated, the second feature is that, despite the strong recovery following the Great Recession, youths are now entering a new crisis with much higher unemployment rates: in 2007 the youth unemployment rates for the 20-24 and 25-29 year-old groups were, respectively, 15%, and 9%, while the corresponding rates in 2019 were, respectively, 29.8%, and 19%.

Fig. 1. Unemployment rates by age group, 1983-2020



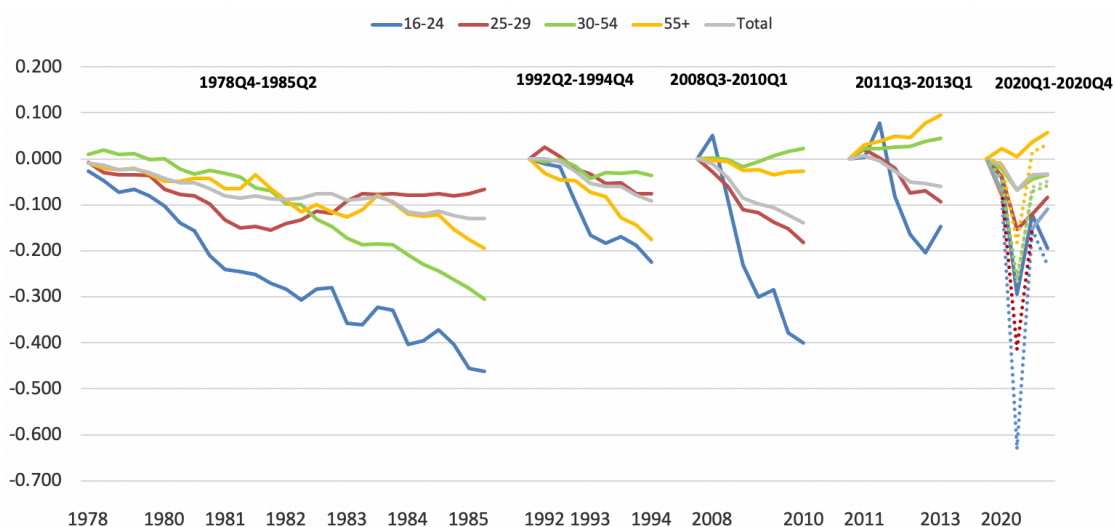
Note: Annual data. Source: OECD Statistics (stats.oecd.org).

⁴ For more information on international comparisons of unemployment fluctuations and some of their determining factors, see Hernanz and Jimeno (2017).

Lastly, the school-to-work transition is particularly slow in Spain. Data from the 2009 ad-hoc module of the European Labor Force Survey (LFS) indicated that the average time between leaving formal education and starting the first job for people with upper secondary and post-secondary non-tertiary education was 7.3 months in the EU-27 vis-à-vis 8.8 months in Spain. The figures for people with tertiary education were 5.1 and 7 months, respectively. More recent data indirectly reinforce the idea of a slow transition. In 2019 the employment rate for people aged 15 to 34 years old in the EU-27 was equal to 75.7%, while in Spain it was only 64.6%.

Figure 2 provides a more detailed account of the relative labor market performance of young and adult workers in recent recessions. In the two recessions of the 1980s and early 1990s, young workers in the age group 25 to 29 performed better than older age groups. During this period the Spanish economy was undergoing a structural transformation, with intense labor reshuffling from agriculture and traditional manufacturing to new technology-intensive manufacturing industries and to services. At the same time, university enrolment was strongly increasing. By contrast, all three recessions in the XXI century are characterized by a clear monotonic age pattern with above-average reductions in employment rate for young workers and below-average reductions or even a modest increase in employment rates for prime age (30-54 years old) and older cohorts (over 55 years old).

Fig. 2: The fall in employment rates in recessions by age group, 1978-2020



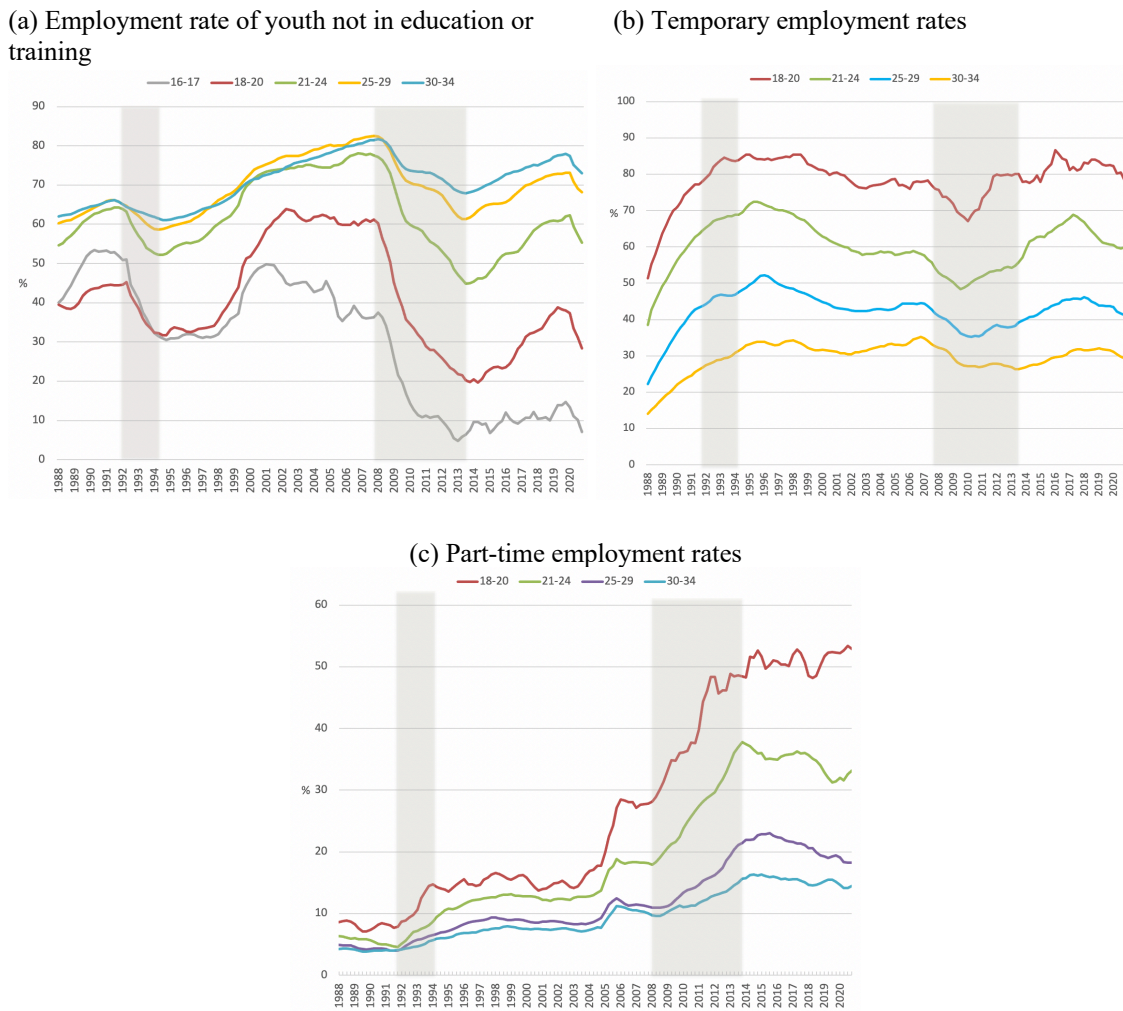
Note: The figure shows the difference in log employment rates between the last quarter before the start of a recession and the last quarter prior to the first increase in total employment. A recession is defined as two consecutive quarters with negative GDP growth rate. For the first four recessions, net employment decreases are depicted until the quarter prior to an increase in total employment. For the ongoing Covid-19 recession, we depict all the quarterly variations from 2019Q4 to 2020Q4. Dotted lines depict effective employment excluding temporary layoffs. Sources: National Accounts GDP series and Labor Force Survey, 1976Q3-2020Q4, Instituto Nacional de Estadística (ine.es).

The higher impact of recessions on the employment rates of young workers is a general phenomenon in most countries. Again, there are well-known reasons for this fact. Firms

typically use the LIFO principle (last-in, first-out) to adjust their labor force and employment protection legislation tends to provide higher coverage to older workers (with longer notice periods and higher severance payments for firing, among other provisions). Thus, changes in job flows in recessions typically hit young workers harder. When job creation falls, new entrants to the labor market are especially likely to find fewer job opportunities and also poorer ones. When job destruction increases, those with lower job experience and shorter employment spells are most likely to lose their jobs.

But, again, the magnitude of the differential in employment losses between young and adult workers in Spain is peculiar and it cannot be separated from another characteristic feature of the Spanish labor market: the prevalence of temporary contracts in new hires (above 90% since the early 2000s).

Fig. 3: Total, temporary, and part-time employment rates by age group, 1988-2020



Note: The three panels report backward-looking moving averages of four quarters. Source: Labor Force Survey, Instituto Nacional de Estadística (ine.es).

Figure 3 provides information on the employment status of young workers. Panel (a) shows that both the level and the stability of employment rates increase with age. On the

other hand, the prevalence of temporary employment falls with age as shown in panel (b): while the average temporary rate has fluctuated between 25% and 33% since the early 1990s (not shown in the figure), for young workers these rates hover around 80%, 60% and more than 40%, respectively, for the 18-20, 21-24, and 25-29 year-old groups. Even for employees between 30 and 34 years old, the temporary rate is still around 30%, which suggests that the transition between temporary and regular employment takes place at a very low speed. Finally, panel (c) shows a marked increase in part-time employment since 2005, which, among other things, is relevant for the evolution of wages to be described below.

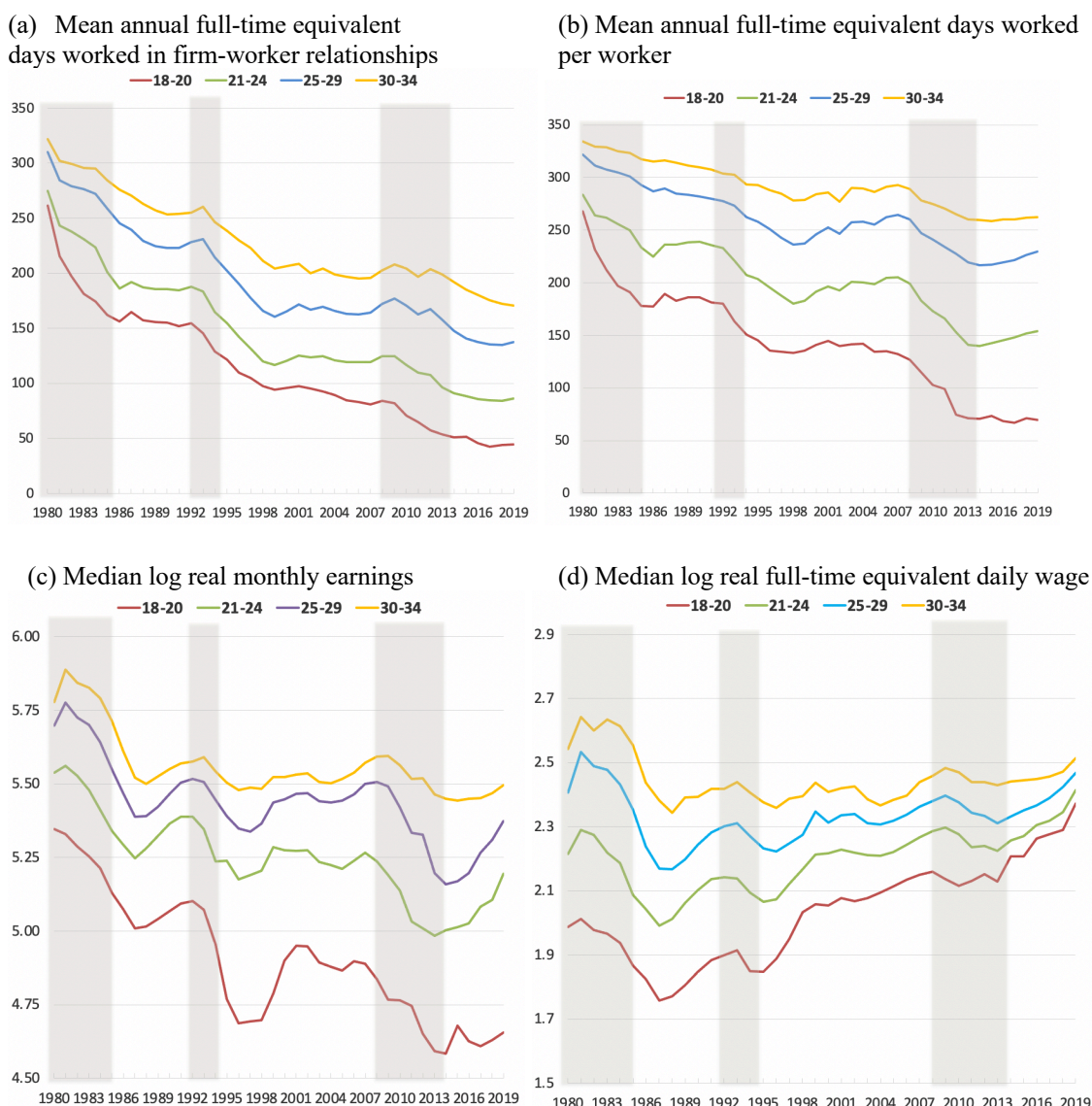
Social Security data from the Continuous Sample of Working Lives (CSWL, see Data Appendix) allow a closer examination of the early labor market outcomes of young workers in Spain. For illustrative purposes, we use the 2019 wave of the CSWL to compute annual statistics for earnings and days worked going back to the worker's time of labor market entry.⁵

Figure 4 plots the means of four variables: the annual days of work of individuals, the annual days of work in a given firm-worker relationship, monthly earnings and full-time equivalent daily wages of youths who worked at some point during the year (including self-employment)⁶. For all four age groups we observe marked negative trends in annual days worked, which are associated to both a reduction in the duration of temporary jobs and the rise of part-time work shown in Figure 3. Panels (a) and (b) show that days worked fall sharply in recessions and, surprisingly, barely stabilize in expansions, when job opportunities increase across the board. Indeed, in 2019 our two indicators of the mean days of work were still close to their all-time lows at the end of the Great Recession. As for wages, panel (c) reveals a trend reduction of real monthly earnings, with strong losses during recessions and partial recovery during expansions. When adjusted for working hours, panel (d) shows the same initial fall, but then sustained rises for all groups subsequently, which are weaker the older is the group of workers and still punctuated by reductions during recessions.

⁵ Note that, due to this choice of sample, we are not reporting longitudinal variables, since individual workers move up across lines as they age, and the data are affected by worker attrition.

⁶ Detailed descriptions of these variables appear in the next section and in the Data Appendix.

Fig. 4: Annual days worked and wages by age group, 1980-2019

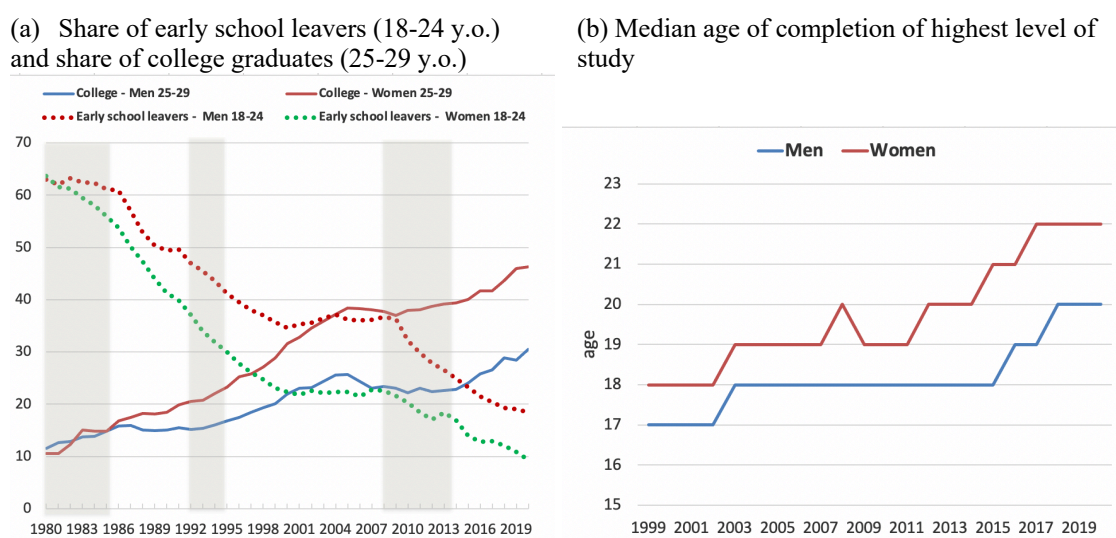


Notes: Panel (a): average length of employment relationships in a given calendar year, transformed into full-time equivalent days of work using the part-time coefficient reported in the CSWL. Panel (b): same as (a) for employees and the self-employed working in the corresponding year. Panel (c) Median monthly earnings for employees in work. Panel (d) Median daily wage converted to full-time equivalent as in (a). Source: Continuous Sample of Working Lives, Ministerio de Inclusión, Seguridad Social y Migraciones.

It is worth stressing that there are strong composition effects in the evolution of earnings of young workers, since there has been a significant increase in their educational attainment and, consequently, in the age of new entrants to the labor market. Figure 5 shows that dropout rates among youth decreased by around 45 pp during the last four decades, while the proportion of university graduates among the young population is now five times larger, in the case of women, and three times larger in the case of males, despite the slowdown observed during the period of the housing bubble (2001-2008). Consequently, the median age at transiting from school to work has risen by four years for women and by three years for men since the late 1990s. This increase, partly associated to reforms of university education, lowered the employment rates of the

youngest workers even more, since simultaneously studying at university and working in either seasonal or part-time jobs is very infrequent in Spain (less than 10% of the 18-24 year olds do it). Hence, most new entrants to the labor market have no previous labor market experience. Moreover, as shown by Dolado et al. (2000) higher educated workers crowd-out lower educated ones from their traditional entry jobs, so that a combination of rigid labor market institutions and an increase in the relative supply of higher educated workers harmed the training prospects of lower educated workers.

Fig. 5: Dropout rates, share of college graduates, and median age of completion of the highest level of study, by gender, 1980-2019

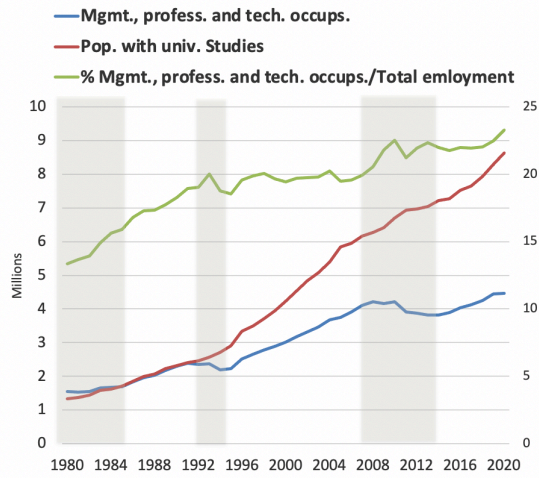


Notes: The data correspond to the native population. Source: Labor Force Survey, Instituto Nacional de Estadística (ine.es).

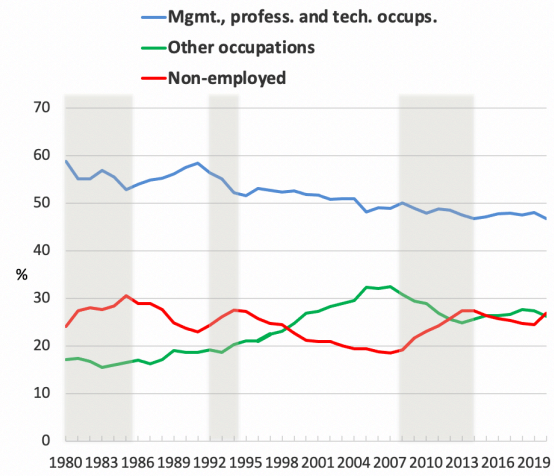
Labor supply was not the only variable that changed during this period. The sectoral and occupational structures of entry jobs for young workers went through a significant reshuffle as well. Panel (a) in Figure 6 shows a remarkable increase in employment in high-skilled occupations (managerial, professional, and technical positions), which currently account for more than 10% of total employment, against only 3% in 1980. Despite this increase, however, university graduates did not take full advantage of the new job opportunities, as shown by the more or less constant share of university graduates in these high-skilled occupations, as seen in panel (b) of Figure 6.

Fig. 6: High-skilled occupations and population with university studies, 1980-2020

(a) Employment in high-skilled occupations and population with university studies



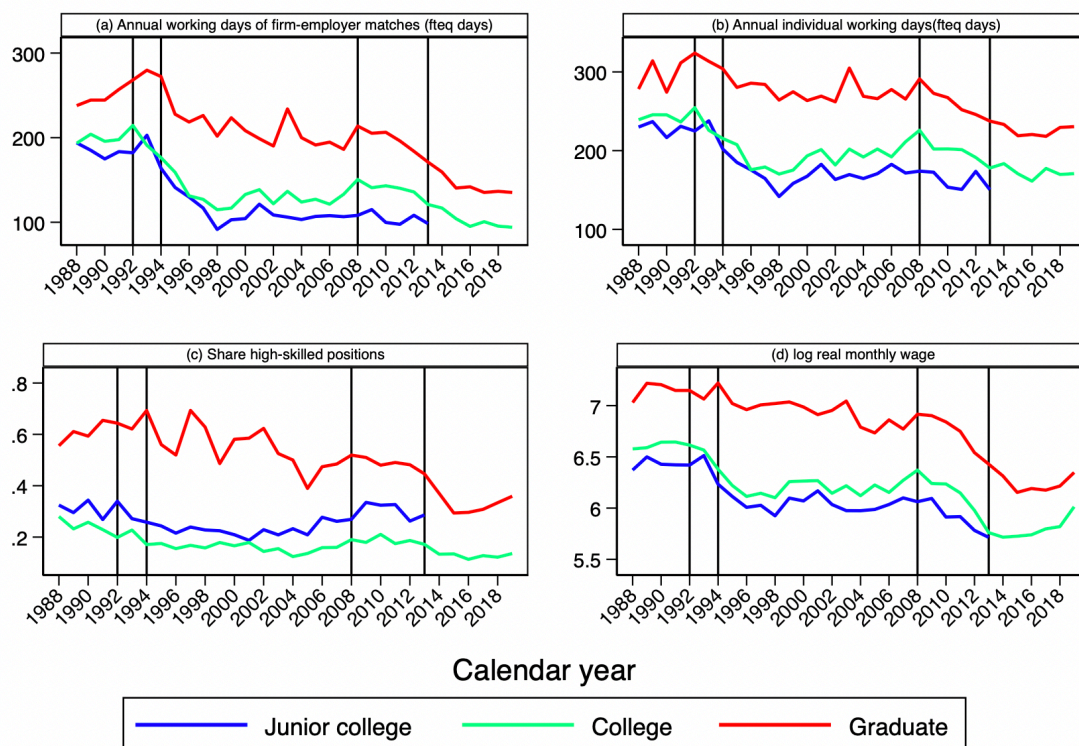
(b) Share of population with university studies in high- skilled occupations, in other occupations, and non-employed



Source: Labor Force Survey, Instituto Nacional de Estadística (ine.es).

Focusing on new entrants with a university degree, Figure 7 shows the continuous deterioration of the labor market outcomes for young workers with either junior college (3 years), college (4 years) or graduate degrees. Again, this arises from strong decreases in annual days worked—either in firm-worker matches or for the whole year—and in wages during recessions, and small gains, if anything, in the subsequent recoveries. It is also worth noting that the proportion of young workers with graduate studies in high skill jobs has been decreasing since the early 1990s, with only a slight improvement in the last five years. Taken together, these evolutions provide a clear signal that there has been a trend worsening of the labor market opportunities for young people. The negative impact of recessions become permanent since it does not get reversed in expansions.

Fig. 7. Entry wages and annual days worked of new entrants with university education, 1987-2019



Source: Continuous Sample of Working Lives, Ministerio de Inclusión, Seguridad Social y Migraciones.

3. Youth employment and wages: A descriptive analysis by cohorts

To offer more insights on the deterioration of the labor market outcomes of youth in Spain, we follow different cohorts throughout their working careers from the time of entry to the labor market. In line with our empirical analysis in the next Section, each cohort is defined by their province of residence and year of graduation. The latter is not directly observed but rather imputed from the Labor Force Survey data, which allows us to establish a correspondence between the dates of birth and graduation. Similarly, the province of residence at the time of graduation is not observed either. Taking advantage of the low mobility of young Spaniards during their educational period, we take the province of birth as the proxy of the province of residence at the graduation date.⁷

Regarding our outcomes of interest, for each cohort, education group, and calendar year we examine four variables. For worker compensation, we compute the median of each worker's maximum monthly earnings within the year and maximum daily wage during the year. For employment we compute the total days worked in each employment spell and the total days worked by each worker throughout the year⁸. These variables are

⁷ We also construct cohorts using the province of residence at first employment. As shown in next Section, nothing qualitatively important changes under this alternative definition.

⁸ The reason why we use the above definitions, as opposed to simple averages, is that we think they are more representative of the worker's situation in a context in which most young workers have many short employment spells with the same or different firms within a year.

computed from Social Security administrative data (CSWL), which capture all employment spells with a daily frequency. All variables except the monthly wage are computed as full-time equivalents using the information provided by the ratio of part-time work. The variables are used as cell-level. This procedure is standard in the literature, since the seminal article by Oreopoulos et al. (2012).

In Section 2 we documented the comparatively strong impact of recessions on young workers when compared to older cohorts. With the cohort analysis presented below, we highlight the evolution of the relative performance of new entrants to the labor market during the last three decades, so that we can identify to what extent the deterioration of the youth labor market has affected young workers at different stages of their working careers. Additionally, the literature has emphasized that recessions may have so-called *scarring effects* on the unemployed or on those losing their jobs. Again, these scarring effects ought to be significantly higher when transitions to regular, stable jobs take longer.

In what follows, we restrict attention to youth with a university degree. If scarring effects are present, we expect them to be more evident among young people with a university degree for whom on-the-job human capital accumulation may be severely hampered in recessions. Another reason to focus on university graduates is that their age of entry to the labor market is likely to be less endogenous than for less educated workers. As already indicated, the available data on age at graduation by province allow us to impute the year of labor market entry for these workers. University graduates are split into the three, more homogeneous subgroups we have been considering, i.e., junior college (a minimum of three years), college (initially five years, then reduced to four, see Section 4), and graduate studies (master or PhD). This is the maximum disaggregation available in the Social Security data.

The cohort analysis allows us also to estimate the magnitude of the scarring effects, as shown in the next Section. They are defined as the implications on future employment and wage profiles of young workers transiting from school to work during recessions. Combining data from the Spanish LFS and the CSWL (see Appendix 1), we construct population cohorts of new entrants to the labor market at each calendar year and follow them along their working lives.

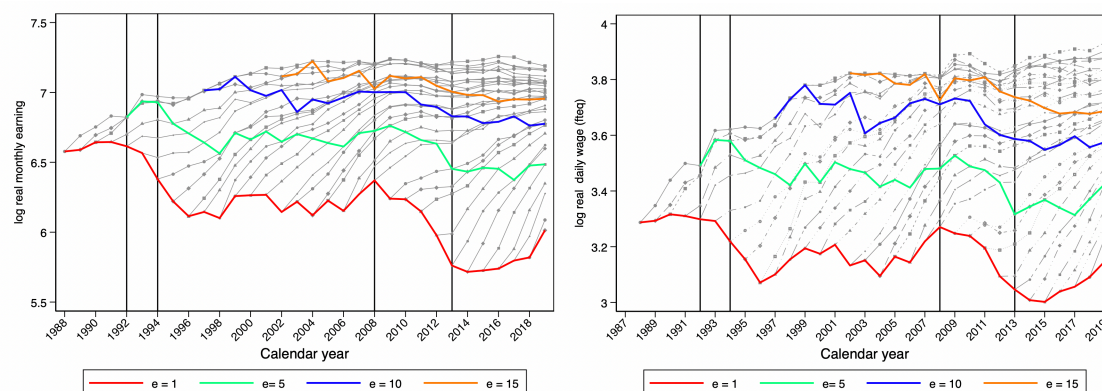
Figure 8 plots the wage profiles, for both monthly earnings and full-time equivalent daily wages, of new entrants to the labor market with university studies with college and graduate degrees. Apart from the decreasing trend in the entry wage (the red line) already highlighted in Section 2, we observe that wages after 5, 10, and 15 years of potential experience (the green, blue, and orange lines, respectively) follow a similar pattern to entry wages. Note that the wage profiles for workers with a graduate degree become flat after 10 years. To some extent this is due to the fact that the CSWL, which is a data set extracted from social security contribution records, only reports capped earnings when the cap for the firm's contribution is reached. For this reason, in our analysis of scarring effects in Section 4 we stop at 10 years of potential experience.

The figure shows that the decreases in earnings are much higher in the case of workers with a graduate degree than for those with a college degree. It also makes it apparent that earnings losses suffered in recessions are not compensated by higher gains in expansions. This is strongly suggestive of the presence of scarring effects. Interestingly, the later

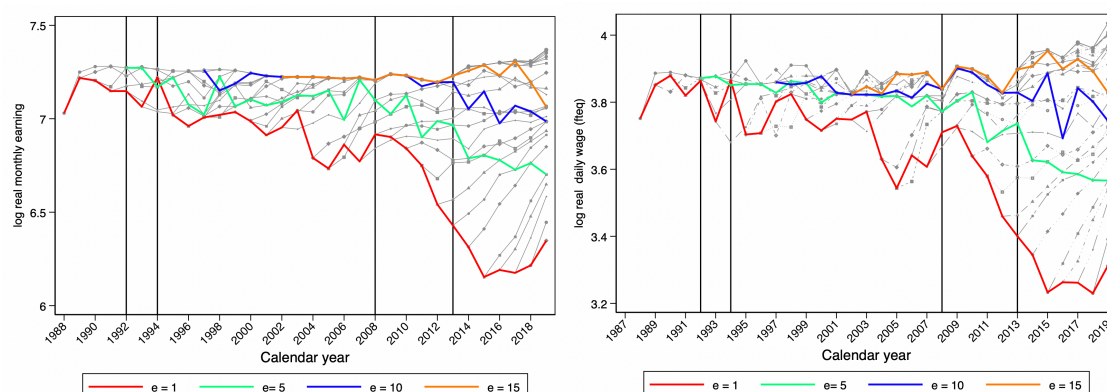
cohorts, i.e., those entering after 2010, seem to have steeper wage profiles, but in their case the impact of the ongoing Covid-19 crisis remains to be seen.

Fig. 8. Wage profiles of new entrants to the labor market by education

(a) College degree



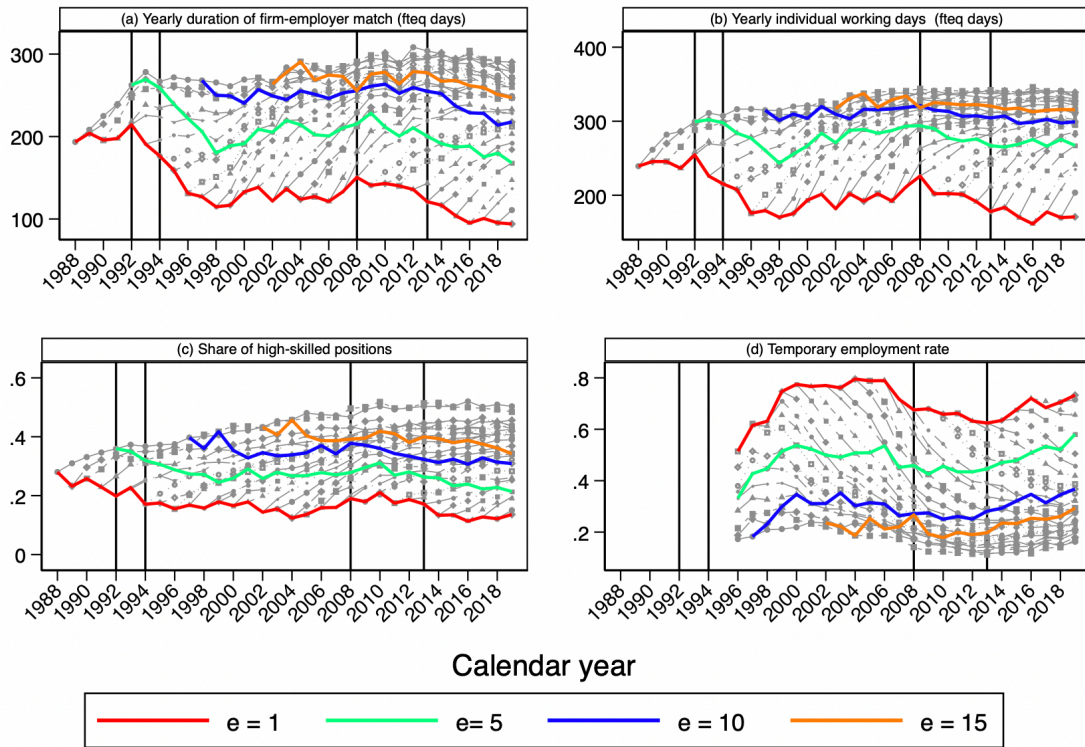
(b) Graduate degree



Note: The left-column figures represent full-time equivalent log real monthly earnings and the right-column figures full-time equivalent log real daily wages. The levels of these variables are represented for annual values of potential experience (e), including lines connecting the values for, respectively, 1 (red), 5 (green), 10 (blue), and 15 years (orange). Source: Continuous Sample of Working Lives, Ministerio de Inclusión, Seguridad Social y Migraciones.

Figure 9 plots the evolution of the share of young workers employed in high skill jobs, along with annual days worked –both for firm-worker matches and for individual outcomes–, and the incidence of temporary employment. As in the case of wages, the initial outcome at the graduation date is highly correlated with the outcomes after 5, 10, and 15 years of potential experience. In particular, over the sample period, the deterioration in annual days worked, the lack of gains in the share in high skill jobs, and the high incidence of temporary employment at graduation are quite persistent. In the next Section we provide an assessment of the relative importance of scarring effects and a continuous deterioration of youth labor markets in explaining these patterns.

Fig. 9. The evolution of the share of high skill jobs, annual days worked and the share of temporary employment, 1987-2019



Note. The levels of all variables are represented for annual values of potential experience (e), including lines connecting the values for, respectively, 1 (red), 5 (green), 10 (blue), and 15 years (orange). Temporary employment data are not representative until 1996. Source: Continuous Sample of Working Lives, Ministerio de Inclusión, Seguridad Social y Migraciones.

4. Estimating scarring effects and trends in youth employment and earnings

4.1. Empirical strategy

Our empirical strategy for estimating the long-term effects of initial labor market conditions on youth employment and earnings exploits the variation in unemployment rates by province of birth and year of graduation but, contrary to the existing literature on scarring effects (see Oreopoulos et al. 2012, Fernández-Kranz and Rodríguez-Planas 2018), we also allow for a trend component. This component is meant to capture any systematic changes over time in the earnings-experience profiles of labor market entrants.

As already indicated, our outcomes of interest are the log median real monthly earnings, log median real daily wage in full-time equivalents, the mean annual days of work in worker-firm matches, and mean annual days of work per worker, distinguishing between three education levels (junior college, college, and graduate degrees). We will also present separate estimations by gender below.

Let y_{cpt} denote the relevant labor market outcome in period t of a cohort graduated in year c in province p . We start our exploration with the following cell-level baseline specification or Model 1, that is estimated for each level of university education:

$$y_{cpt} = \alpha + \beta_e \gamma_e U_{cp0} + \theta_p + \gamma_e + u_{cpt} \quad (1)$$

where θ_p and γ_e represent unrestricted province and years of potential experience fixed effects, respectively, and U_{cp0} is the initial province-level unemployment rate at graduation. Notice that we use the overall unemployment rate at the province level and not the youth unemployment rate as the latter variable may be affected by changes in the supply of university graduates. There are 50 provinces, and the sample period is 1987-2019. Only the first ten years of each cohort, when available, are included in the sample.⁹

In this specification the β_e coefficients capture the persistent effects of the initial conditions at graduation on the labor market outcomes which are allowed to vary with potential experience. We include fixed effects for a maximum of ten years of potential experience. Given the presence of experience and province fixed effects, the coefficients of the interaction term measure changes in experience profiles in earnings and employment resulting from province-level variations in unemployment rates under the (unrealistic) assumption that all calendar years and cohorts are the same.

The baseline model implies assuming that there are no changes over time in either the characteristics of the entering cohorts or the conditions of the youth labor market. Thus, all cohorts are supposed to be the same (there is no unobserved heterogeneity) and the labor market outcomes of young workers are assumed to be affected only by the unemployment rate in the province at which they enter the labor market. In subsequent steps, we add covariates to the model in order to obtain more reliable estimates of the scarring effects of the initial conditions once we take into account structural trends, cohort-specific features, and the persistence in unemployment rates. In a second specification (Model 2), we add interactions between a linear time trend and the dummies for years of potential experience. A negative coefficient on these interactions between trends and experience terms would indicate that youth labor market conditions have worsened over time due to structural changes in either the demand of labor, the supply of labor, or the institutional configuration of the labor market. The interactions terms allow these changes to be different at each year of experience.

Over the more than thirty-year horizon in our sample there are many factors that may cause these structural shifts in experience profiles. On the supply side, Spain has witnessed an enormous rise in enrolment in university education, especially among women. As a consequence, the average quality of university graduates may have changed over time, while the growth in demand for university graduates lagged behind the growth in supply in many fields, creating excess supply in the labor market. Moreover, the introduction of the so-called *Bologna process*, which created the European Higher Education Area, shortened the duration of most college degrees from five to four years and led to a proliferation of new college and graduate degrees. Similarly, on the demand side, skill-biased technological change may have improved the labor market position of

⁹ Our sample is a random extraction from the population of Spanish workers. However, since we construct our sample backwards from the last year (2019), older cohorts are observed for longer lengths of time in the labor market, which imparts a systematic source of cell-size variation.

university graduates, but the increased complexity of jobs may also have lengthened their school-to-work transitions. Last but not least, institutional factors play a key role in shaping the profiles of entrants. Not only did Spain witness several labor market reforms (in 1994, 1997, 2006, 2010, 2011, and 2012), but these reforms were often implemented in the aftermath of recessions and involved measures that relaxed the conditions for the use of temporary contracts. In other words, the adverse conditions during a recession may cause structural shifts in entrant profiles due to the endogenous adoption of reforms.

In a final specification (Model 3), to control for unobserved changes in the supply side, we add unrestricted cohort-specific fixed effects to the set of covariates. These fixed effects capture all time-invariant cohort-specific features. We also include the contemporaneous national unemployment rate, which controls for the state of the business cycle in subsequent years. Oreopoulos et al. (2012) interact this variable with the potential years of experience fixed effects in order to eliminate lasting effects from the persistence of unemployment rates. By contrast, here we only filter out the common or average contemporaneous impact of the unemployment rate on the labor market outcomes of all cohorts.

4.2 Identification

Our identification procedure relies on the assumption that the year of graduation and the province of residence are exogenous variables. Selective graduation decisions and self-selection into migration to other provinces (or countries) would undermine our identification. However, notice that we use imputed rather than actual graduation ages. This proxy is exogenous from the perspective of an individual and the same is true of our proxy for the province of residence. The province of birth is a powerful predictor of the province of residence at graduation, as almost 90% of Spaniards attend university in their province of birth.¹⁰ For university graduates in the age group below 35 years old, the share of individuals who live in their province of birth is lower than for university students. To avoid potential bias in our estimates due to post-graduation migration, as already indicated, we consider a robustness check in which we collapse the individual-level data at the level of cohort, province of first employment after graduation, and calendar year. The results confirm the robustness of our results. Nonetheless, we do not claim that our estimation captures the causal effect of entering the labor market in a recession on the long-term outcomes of young workers. Our method is more akin to a decomposition exercise. Nevertheless, in our choice of specification we have tried to deal with potential endogeneity issues, that we now discuss.

4.3 Data description

The sample period is 1987-2019 for college and graduate workers. For junior college workers it is 1987-2013, since these degrees disappeared after 2013 as a result of the Bologna process. As to other variables, the average national unemployment rate is 17%, with a standard deviation of 5.3%, ranging from 8.2% to 26.1%. Provincial unemployment rates show a standard deviation of 7.7%, ranging from 3% to 43.2%. The large variation over time and across provinces helps identify the parameters of interest.

¹⁰ Also, the share of people aged 25-34 years old with university degrees who reside in their province of birth averages 80% for the period 1992-2020 according to the LFS.

Table 1 presents a set of descriptive statistics at the level of the cells and separately by education level. All variables except for real monthly earnings are measured in full time equivalents. See Appendix 1 for details about the construction of our sample.

The Table shows that both earnings and days of work increase with education, as expected, though the slope between junior college and college is not very pronounced (with an increase of 17% in monthly earnings). The level of monthly earnings is quite low, showing extremely low values at the first decile and also low values at the ninth decile, though they are not adjusted for days or hours of work. Annual days of work by match are also very low, with the averages going from 5.6 to 7.2 months, which reflects the prevalence of very short temporary contracts. Annual days by worker are also relatively low, ranging from 7.5 to 9.2 months per year. The difference between the two variables indicates that young workers quickly move from one temporary contract to another.

Table 1. Descriptive statistics of the cohort-province-year cells

	Mean	Std. dev.	P10	P90
Junior College				
Real monthly earnings	587.4	217.9	320.2	871.6
Real daily wage	25.8	7.4	18.4	34.1
Annual days worked by match	170.0	68.0	83.2	255.3
Annual days worked by worker	228.4	71.5	130.2	311.3
College				
Real monthly earnings	687.8	257.4	345.2	1031.0
Real daily wage	29.2	8.0	19.9	38.7
Annual days worked by match	184.5	64.3	99.4	261.7
Annual days worked by worker	246.1	65.3	154.1	318.6
Graduate				
Real monthly earnings	984.1	355.3	486.9	1381.6
Real daily wage	40.7	35.1	25.0	49.3
Annual days worked by match	219.3	80.5	121.9	365.0
Annual days worked by worker	279.8	74.2	190.4	365.0

Note. Period: 1987-2019. The cell sizes are 8,809 for Junior college, 9,929 for College and 7134 for Graduate degree. The unit of analysis is the cohort-province-year cell. P10 denotes the first decile and P90 the ninth decile. All variables except for real monthly earnings are measured in full time equivalents. Monthly earnings and wages are expressed in real euros with 1987 as the base year. Source: Continuous Sample of Working Lives, Ministerio de Inclusión, Seguridad Social y Migraciones.

4.4. Results

Table 2 reports the main results from the estimation of our baseline specification, equation (1), which includes province and years of potential experience fixed effects, as well as interactions of the latter with the initial province-level unemployment rate at graduation, which capture the scarring effects. Table 3 presents the estimates of the specification that

adds to the baseline the interaction of the potential experience fixed effects with a time trend. Tables 2 and 3 present only the estimated effects on entry (labeled year 0) and in the fifth (year 4) and tenth year (year 9), while the full results are included in the online Appendix.

Table 2. Model 1 estimates of scarring effects

	Log real monthly earnings			Log real daily wages		
	Junior college	College	Graduate	Junior college	College	Graduate
U0 x (e=0)	.003 (.002)	-.010*** (.002)	-.025*** (.003)	.002 (.001)	-.004*** (.001)	-.014*** (.002)
U0 x (e=4)	-.001 (.001)	-.012*** (.001)	-.022*** (.002)	-.001 (.001)	-.005*** (.001)	-.012*** (.001)
U0 x (e=9)	.005*** (.001)	.001 (.001)	-.007*** (.002)	.001 (.001)	0.000 (.001)	-.004*** (.001)
Constant	5.902*** (.050)	6.037*** (.047)	6.786*** (.087)	3.098*** (.024)	3.183*** (.020)	3.605*** (.052)
Observations	8809	9929	7134	8808	9929	7132
R-squared	0.535	0.689	0.457	0.52	0.716	0.444
	Annual days worked by match			Annual days worked by worker		
	Junior college	College	Graduate	Junior college	College	Graduate
U0 x (e=0)	1.996*** (.288)	-.020 (.207)	-2.550*** (.314)	1.251*** (.314)	-.647*** (.207)	-2.679*** (.275)
U0 x (e=4)	-.124 (.216)	-1.824*** (.163)	-3.558*** (.257)	-.461** (.195)	-1.240*** (.140)	-2.316*** (.208)
U0 x (e=9)	.572*** (.193)	-.100 (.182)	-1.819*** (.442)	.724*** (.156)	.406*** (.131)	-.373 (.335)
Constant	71.138*** (8.216)	82.539*** (6.803)	205.413*** (11.329)	127.772*** (8.288)	150.286*** (6.048)	282.182*** (11.334)
Observations	8809	9929	7134	8809	9929	7134
R-squared	.524	.662	.377	.636	.764	.399

Note. The model includes fixed effects for the province of birth and years elapsed since graduation. Standard errors are in parentheses. *** $p < .01$, ** $p < .05$, * $p < .10$.

Table 3. Model 2 estimates of scarring and trend effects

	Log real monthly earnings			Log real daily wages		
	Junior college	College	Graduate	Junior college	College	Graduate
U0 x (e=0)	-.005** (.002)	-.007*** (.001)	-.010*** (.002)	.002 (.001)	-.003*** (.001)	-.006*** (.001)
U0 x (e=4)	-.008*** (.001)	-.009*** (.001)	-.012*** (.001)	-.002*** (.001)	-.004*** (.001)	-.006*** (.001)
U0 x (e=9)	-.004*** (.001)	-.004*** (.001)	-.006*** (.002)	-.002** (.001)	-.003*** (.001)	-.003*** (.001)
Trend x (e=0)	-.024*** (.002)	-.0230*** (.001)	-.048*** (.002)	.004*** (.001)	-.007*** (.001)	-.027*** (.002)
Trend x (e=4)	-.017*** (.001)	-.013*** (.001)	-.022*** (.001)	-.004*** (.001)	-.006*** (.001)	-.013*** (.001)
Trend x (e=9)	-.016*** (.001)	-.013*** (.001)	-.012*** (.001)	-.007*** (.001)	-.008*** (.001)	-.005*** (.001)
Constant	6.361*** (.061)	6.444*** (.043)	7.725*** (.078)	3.037*** (.034)	3.301*** (.023)	4.143*** (.047)
Observations	8809	9929	7134	8808	9929	7132
R-squared	.641	.799	.655	.538	.755	.625
	Annual days worked by match			Annual days worked by worker		
	Junior college	College	Graduate	Junior college	College	Graduate
U0 x (e=0)	.628** (.267)	.416** (.185)	-.940*** (.238)	.223 (.307)	-.288 (.21)	-1.393*** (.237)
U0 x (e=4)	-1.143*** (.208)	-1.496*** (.184)	-1.947*** (.213)	-1.089*** (.188)	-1.150*** (.163)	-1.291*** (.199)
U0 x (e=9)	-.96*** (.195)	-.841*** (.183)	-1.865*** (.322)	-.171 (.18)	.107 (.149)	-.417 (.272)
Trend x (e=0)	-4.196*** (.372)	-3.044*** (.157)	-4.924*** (.29)	-3.464*** (.364)	-2.332*** (.164)	-4.135*** (.25)
Trend x (e=4)	-2.557*** (.213)	-1.939*** (.177)	-3.863*** (.253)	-1.549*** (.182)	-.534*** (.143)	-2.446*** (.219)
Trend x (e=9)	-2.7*** (.223)	-1.861*** (.184)	-3.118*** (.335)	-1.515*** (.182)	-.768*** (.133)	-2.139*** (.29)
Constant	152.74*** (11.699)	136.86*** (6.908)	303.72*** (10.41)	194.13*** (11.236)	191.51*** (6.638)	364.10*** (10.799)
Observations	8809	9929	7134	8809	9929	7134
R-squared	.634	.755	.545	.682	.785	.509

Note. The sample period is 1987-2019 for college and graduate degrees. For junior college workers it is 1987-2013. The model includes fixed effects for the province of birth and years elapsed since graduation. Standard errors are in parentheses. *** $p < .01$, ** $p < .05$, * $p < .10$.

We discuss the estimated scarring effects using graphs that include the full set of coefficients. Figure 10 plots the estimated coefficients of the baseline specification or Model 1 (dashed lines) and the specification with the time trend interactions with experience or Model 2 (solid lines). Since we have three education groups, four outcome variables, and several empirical specifications, we will focus on the estimates for college graduates, who are by far the largest group. The results for the other two education levels are qualitatively similar, so we will briefly comment on them as we go along.

The estimated coefficients for the baseline Model 1 plotted in Figure 10 clearly suggest that the initial conditions faced at graduation have a strong and persistent impact on entrant earnings. For instance, for monthly earnings, the semi-elasticity of with respect to the unemployment rate at the time of graduation reaches a maximum of -1.5 in the second year and it becomes -0.5 seven years after graduation, losing significance thereafter. The coefficients in the graph are multiplied by 100, so this estimate means that an increase of 1 pp in the provincial unemployment rate is associated with a drop in monthly earnings of 1.5%. To get a sense of magnitudes, this implies that over the Great Recession, a young person entering the labor market in 2013 in the province with the lowest unemployment rate in 2007 (Guipúzcoa) would have 13.5% lower monthly earnings two years later than an entrant in 2007, while the corresponding figure for the province with the largest unemployment rate (Jaén) would be a staggering 39.4% loss. The impact of unemployment on the full-time equivalent daily wage in this specification is lower, reaching a maximum of -0.5 in year 2 and dropping to -0.3 in year 9, which reveals that part of the effect on monthly earnings comes from lower hours of work.

These estimates are smaller than those for the annual earnings of college graduates in the related literature.¹¹ In particular, for the US Oreopoulos et al. (2012, Table 2) estimate the peak effect is -1.8% in years 0-1, even though their specification includes fixed effects by region of residence, graduation cohort, potential labor market experience, and calendar year. For Spain, Fernández-Kranz and Rodríguez-Planas (2017, Table 2) estimate a peak effect of -1.6% in the year of entry, including the same fixed effects as Oreopoulos et al. (2012) except that they replace the experience fixed effects by a linear and a quadratic trend.

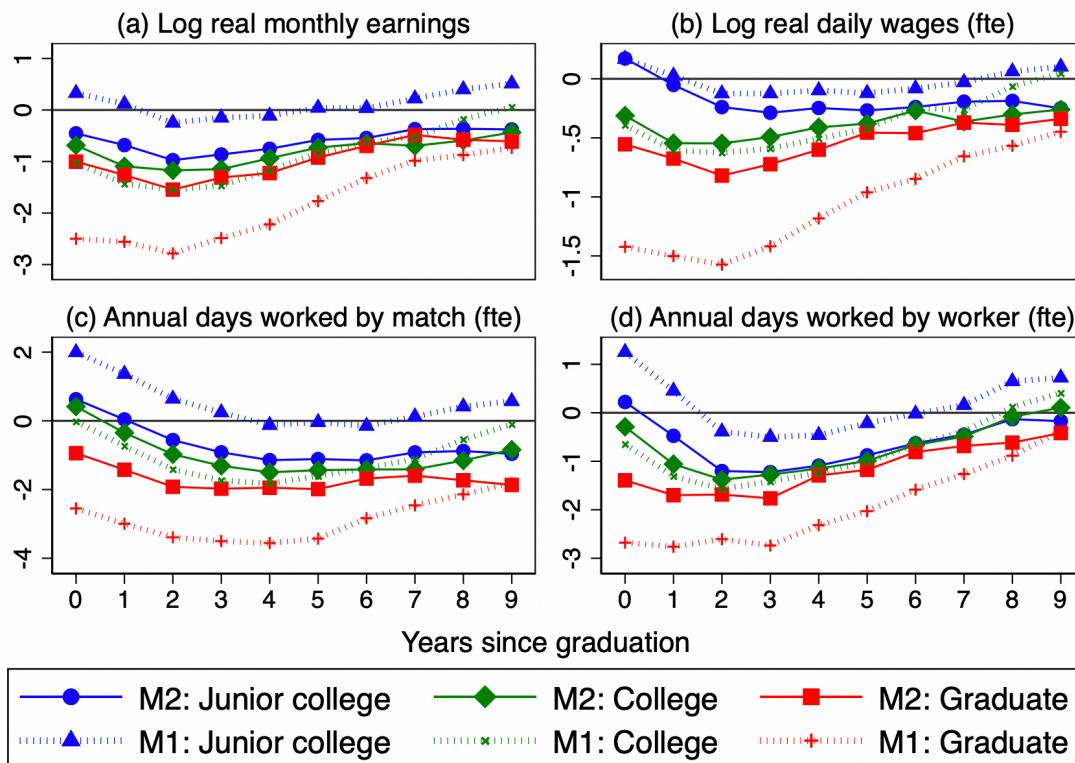
According to the estimates shown in Figure 10, the impact of 1 pp increase in the provincial unemployment rate on annual days worked by worker in year 2 is equal to 1.6 days less and to 1.4 less days worked by match (climbing to 1.8 days in year 4).

As Figure 10 makes clear, the estimated scarring effects are significantly lower in Model 2, which includes the interacted linear trends to control for changes in the conditions of youth labor markets, than in the baseline. The semi-elasticity of monthly earnings to initial unemployment attains a maximum of -1.2 in year 2 and it is equal to -0.5 for daily earnings. Similarly, the impact on annual days worked by worker in year 2 is reduced to 1.4 days less and to 1 day on annual days by worker. These effects have a relatively small magnitude. Thus, while scarring effects are often mentioned as the main culprits of the worsening of the labor market outcomes of young Spaniards, these results suggest that there are also other causes of the deterioration of youth wages and employment beyond the state of the labor market at the time of graduation. And this is in spite of there being two deep recessions in our sample period (1992-94 and 2008-2013).

¹¹ Note, however, that while these two references estimate the effects on annual earnings, we examine monthly earnings defined as explained above and in detail in Appendix 1.

As can be seen in Table 4, the estimated coefficients of the linear trends indicate a continuous and sizeable deterioration in the earnings of young workers upon entry; being equal to -2.3% per year for monthly earnings and -0.7% for full-time equivalent daily wage. The corresponding figures are 2.3 days worked less per worker and 3 days worked less per match. To give a sense of magnitudes, if we compare two similar workers entering the labor market ten years apart, the worker with the later entry would have a 7% lower daily wage and would work 23 days less, i.e., a 9.3% reduction with respect to the average days worked shown in Table 1. These are very large impacts, that swamp the estimated scarring effects.

Fig. 10. Estimated coefficients of scarring effects under the baseline specification



Let us make two final comments on Figure 10. First, the effect of initial unemployment on youth labor market outcomes is not largest on impact but it keeps on accumulating for several years after graduation. Second, the impact is higher the more educated workers are, but this feature turns out not to be robust for earnings in our next specification.

In order to dig deeper into the causes of the youth labor market deterioration, we estimate an alternative specification, labeled as Model 3, with cohort fixed effects—defined by the year of graduation—and also including the yearly aggregate national unemployment rate. While the fixed effects account for differences in the characteristics of each cohort—i.e., size, composition by educational attainment and field of study, etc.—, the aggregate unemployment rate controls for the cyclical conditions in each year. Table 3 shows the estimates for years 0, 4, and 9, while the online Appendix includes the full set of estimates.

Table 4. Model 3 estimates of scarring and trend effects

	Log real monthly earnings			Log real daily wages		
	Junior college	College	Graduate	Junior college	College	Graduate
U0 x (e=0)	.005** (.002)	.005*** (.002)	.006* (.003)	.005*** (.002)	.002 (.001)	.004* (.002)
U0 x (e=4)	-.001 (.002)	-.002 (.001)	.001 (.003)	-.001 (.002)	-.002 (.001)	.002 (.002)
U0 x (e=9)	.001 (.002)	.001 (.002)	.001 (.003)	-.002 (.001)	-.002 (.001)	.001 (.002)
Trend x (e=0)	-.0270*** (.002)	-.016*** (.003)	-.035*** (.003)	.002 (.002)	-.005*** (.002)	-.019*** (.002)
Trend x (e=4)	-.019*** (.002)	-.005* (.003)	-.012*** (.003)	-.005*** (.002)	-.003* (.002)	-.007*** (.002)
Trend x (e=9)	-.015*** (.002)	-.003 (.003)	-.013*** (.004)	-.007*** (.002)	-.004** (.002)	-.006** (.002)
National UR	-.008*** (.001)	-.007*** (.001)	-.007*** (.001)	-.005*** (.001)	-.004*** (.001)	-.004*** (.001)
Constant	6.484*** (.067)	6.498*** (.054)	7.342*** (.107)	3.148*** (.042)	3.357*** (.033)	3.907*** (.07)
Observations	8809	9929	7134	8808	9929	7132
R-squared	.665	.812	.687	.561	.766	.656

	Annual days worked by match			Annual days worked by worker		
	Junior college	College	Graduate	Junior college	College	Graduate
U0 x (e=0)	1.425*** (.348)	.891*** (.233)	-.470 (.42)	1.665*** (.366)	.692*** (.238)	-.627 (.397)
U0 x (e=4)	-.292 (.278)	-.798*** (.209)	-.997** (.401)	-.179 (.279)	-.695*** (.188)	-.768** (.374)
U0 x (e=9)	.200 (.283)	.235 (.241)	-1.118** (.468)	.263 (.284)	.245 (.209)	-.482 (.464)
Trend x (e=0)	-4.52*** (.431)	-3.032*** (.422)	-4.391*** (.417)	-4.174*** (.431)	-2.087*** (.79)	-3.945*** (.519)
Trend x (e=4)	-2.940*** (.372)	-2.018*** (.421)	-3.831*** (.427)	-1.845*** (.368)	-.483 (.79)	-2.669*** (.526)
Trend x (e=9)	-2.777*** (.443)	-1.958*** (.485)	-4.369*** (.488)	-1.450*** (.432)	-.449 (.819)	-3.096*** (.589)
National UR	.101 (.155)	.387*** (.126)	.552*** (.165)	-1.518*** (.144)	-1.181*** (.122)	-.742*** (.143)
Constant	161.72*** (12.145)	146.40*** (8.191)	269.72*** (13.668)	224.51*** (11.999)	218.16*** (7.545)	356.84*** (14.615)
Observations	8809	9929	7134	8809	9929	7134
R-squared	.659	.777	.576	.705	.806	.525

Note. The sample period is 1987-2019 for college and graduate degrees. For junior college workers it is 1987-2013. The model includes fixed effects for the province of birth, years elapsed since graduation, and graduation cohort. National UR denotes the national unemployment rate. Standard errors are in parentheses. *** $p < .01$, ** $p < .05$, * $p < .10$.

Figure 11 plots the estimated scarring effects for Model 3, showing also Model 1 estimates for reference. The overall picture changes significantly. For college workers, scarring effects on monthly earnings and daily wages essentially vanish (even showing an anomalous small, positive effect in the first year), while they remain significant, reaching a peak around 7-8 lower days worked.

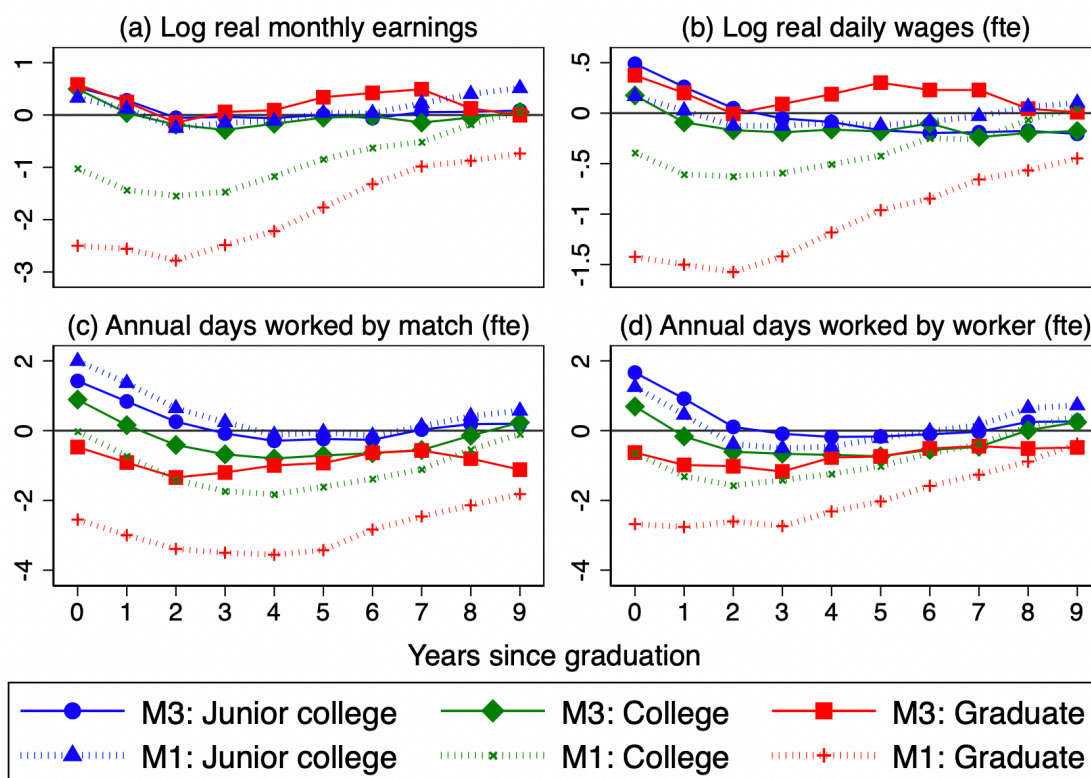
The impact of the current national unemployment rate is negative and statistically significant, with a semi-elasticity of -0.7 , i.e., a 1 pp increase in the national unemployment rate reduces real monthly earnings by 0.7%, while the effect on the full-time equivalent daily wage is 0.4%. Over the Great Recession the national unemployment rate increased by roughly 18 pp, from 8.2% in 2007 to 26.1% in 2013. Our estimate implies that the daily wage of a worker entering the labor market at the end of the Great Recession in 2013 would be 7.2% lower than a similar worker entering in 2007. Let us also note that the unemployment rate has a positive impact (of 0.4 days) on days worked by match, which turns negative (at 1.2 days less) for days worked by worker. This suggests that when the labor market worsens firms destroy the matches with the lowest duration (and most likely on temporary contracts).

The inclusion of cohort unobserved heterogeneity and the aggregate unemployment rate does not make the statistical significance of the negative linear trends go away. Under this specification, scarring effects are also moderate: at the peak in year 2, a 1 pp increase in the provincial rate of unemployment on entry reduces monthly earnings by 1.6%, the daily wage by 0.5%, days worked per match by 3 days, and days worked per worker by 2.1 days.

Uncovering the factors that generate the continuous deterioration of the youth labor market conditions that we capture with the linear trends would require explicitly measuring the factors underlying the unobserved cohort heterogeneity and time effects, including those related to institutional changes, such as employment policies, labor market regulation, etc. We leave this task for future work. For now, our results call into question the magnitude of the scarring effects that are often mentioned to explain the worsening of the labor market outcomes of Spanish young workers.

According to the specification of Model 3, workers with different education levels suffer different impacts. First, scarring effects still increase with the level of education at the peak for days worked, while this is no longer the case for earnings or wages, since they are not significant. Second, the trend deterioration of all four labor market outcomes shows a U-shape with education, being largest for workers with a junior college degree, then for graduate degrees, and smallest for workers with a college degree (see the online Appendix).

Fig. 11. Estimated scarring effects controlling for unobserved heterogeneity and macroeconomic conditions



Alternative specifications for the estimation of scarring effects on wages and days worked could allow for more flexibility in the control of business cycle conditions (through, for instance, calendar time fixed effects) and additional controls for observed cohort heterogeneity. In our sample it is very difficult to separately identify calendar time and graduation time fixed effects, since there are very few cases of different cohorts graduating in the same calendar year; for this reason, we are limited in the parametrization of business cycle controls. As to observed cohort heterogeneity, there are several dimensions in which the size and composition of the cohorts may differ, but in our view the most important one is the gender composition. This is true for three reasons: (a) there are gender gaps in wages and employment rates among young Spaniards, which have been changing over time, (b) the weight of women in the cohorts entering the labor market has increased substantially during the sample period, and (c) women tend to be overrepresented in fields of study with worse labor market prospects).

Hence, we also estimated wage and employment equations separately for men and women. Table 5 provides some of the main results by reporting scarring effects and cohort trends at the year of graduation ($e = 0$) and 5 and 9 years since graduation, for college graduates and for the three empirical specifications discussed above. Overall, we find similar scarring effects across gender groups and more negative time trends in the case of men, although the scarring effects mostly disappear when we control for the trends and the national unemployment rate. In any case, the main conclusions remain: the worsening of labor market outcomes of young Spaniards are a combination of some scarring effects from local conditions at the time of graduation and, especially, a continuous deterioration

of their wages and employment rates not only at the time of transiting from school to work but also some years after graduation.

Table 5. Models 1, 2, and 3 estimates of scarring and trend effects by gender (college)

	Real monthly earnings		Real daily wage		Days worked by match		Days worked by worker	
	Men	Women	Men	Women	Men	Women	Men	Women
Model 1. Interactions of initial unemployment with experience								
U0 x (e=0)	-.004*** (.001)	-.005*** (.001)	-.002*** (.001)	-.002*** (.001)	-.144 (.125)	-.089 (.121)	-.333*** (.125)	-.379*** (.121)
U0 x (e=4)	-.003*** (.001)	-.005*** (.001)	-.002*** (.001)	-.002*** (.001)	-.700*** (.107)	-.876*** (.091)	-.446*** (.074)	-.628*** (.083)
U0 x (e=9)	.001* (.001)	.001 (.001)	.001*** (.001)	.001 (.001)	.027 (.108)	.079 (.108)	.161** (.066)	.163** (.077)
Constant	6.21*** (.049)	5.92*** (.074)	3.22*** (.029)	3.18*** (.043)	120.55*** -6.839	79.51*** -8.984	187.48*** -6.885	142.85*** -10.225
Observations	9458	9596	9457	9595	9459	9596	9459	9596
R-squared	.574	.616	.587	.605	.513	.583	.619	.674
Model 2. Interactions of initial unemployment with experience and trends								
U0 x (e=0)	-.003*** (.001)	-.002** (.001)	-.002*** (.001)	-.001*** (.001)	-.022 (.103)	.256** (.113)	-.240** (.119)	-.113 (.125)
U0 x (e=4)	-.002*** (.001)	-.004*** (.001)	-.001*** (.001)	-.002*** (.001)	-.558*** (.096)	-.684*** (.102)	-.402*** (.079)	-.595*** (.094)
U0 x (e=9)	.001 (.001)	.001 (.001)	.001 (.001)	.001 (.001)	-.130 (.114)	-.155 (.109)	.097 (.074)	.099 (.087)
Trend x (e=0)	-.024*** (.001)	-.022*** (.002)	-.01*** (.001)	-.004*** (.001)	-2.669*** (.194)	-3.234*** (.194)	-1.940*** (.216)	-2.430*** (.211)
Trend x (e=4)	-.014*** (.001)	-.012*** (.001)	-.008*** (.001)	-.003*** (.001)	-1.764*** (.193)	-1.909*** (.201)	-.503*** (.152)	-.296* (.175)
Trend x (e=9)	-.011*** (.001)	-.008*** (.001)	-.006*** (.001)	-.003*** (.001)	-1.077*** (.242)	-1.53*** (.226)	-.463*** (.165)	-.453** (.188)
Constant	6.67*** (.054)	6.31*** (.067)	3.40*** (.035)	3.24*** (.045)	170.29*** -8.132	136.54*** -8.511	223.26*** -8.063	185.51*** -10.534
Observations	9458	9596	9457	9595	9459	9596	9459	9596
R-squared	.672	.699	.639	.618	.578	.67	.636	.695

Table 5. Models 1, 2, and 3 estimates of scarring and trend effects by gender (college) (continued)

	Real monthly earnings		Real daily wage		Days worked by match		Days worked by worker	
	Men	Women	Men	Women	Men	Women	Men	Women
Model 3. Interactions of initial unemployment with experience and trends, cohort fixed effects, national unemployment								
U0 x (e=0)	.001 (.001)	.002** (.001)	.001 (.001)	.001 (.001)	.062 (.123)	.506*** (.117)	.064 (.137)	.419*** (.127)
U0 x (e=4)	.001 (.001)	-.001** (.001)	.001 (.001)	-.001* (.001)	-.300*** (.107)	-.314*** (.095)	-.264*** (.093)	-.308*** (.087)
U0 x (e=9)	.001 (.001)	.002*** (.001)	.001 (.001)	.001 (.001)	.253* (.131)	.386*** (.125)	.123 (.091)	.241** (.107)
Trend x (e=0)	-.019*** (.002)	-.011*** (.003)	-.009*** (.001)	-.003** (.001)	-2.861*** (.339)	-2.781*** (.406)	-1.879*** (.500)	-1.497** (.66)
Trend x (e=4)	-.008*** (.002)	.001 (.003)	-.008*** (.002)	-.001 (.001)	-2.025*** (.352)	-1.509*** (.412)	-.533 (.507)	.506 (.662)
Trend x (e=9)	-.008*** (.002)	.006* (.003)	-.007*** (.002)	.001 (.001)	-1.916*** (.443)	-1.375*** (.472)	-.363 (.539)	.394 (.704)
National UR	-.006*** (.001)	-.005*** (.001)	-.004*** (.001)	-.002*** (.001)	.735*** (.154)	.525*** (.136)	-.91*** (.133)	-1.06*** (.12)
Constant	6.71*** (.064)	6.43*** (.069)	3.45*** (.045)	3.32*** (.048)	172.56*** -9.561	145.19*** -9.942	247.90*** -9.179	208.13*** -10.623
Observations	9458	9596	9457	9595	9459	9596	9459	9596
R-squared	.693	.72	.656	.634	.608	.692	.655	.714

Note. The sample period is 1987-2019. Models 1 and 2 include fixed effects for the province of birth and years elapsed since graduation. Model 3 adds graduation cohort. Standard errors are in parentheses. *** $p < .01$, ** $p < .05$, * $p < .10$.

We also perform an additional robustness check. As indicated, we are relying on the low mobility of Spanish young workers to define the province of birth as the one determining the relevant unemployment rate. In order to gauge the sensitivity of our results to this assumption, we estimate the Model with the province of residence at first employment instead. The estimates for this alternative specification, shown in Figure A.2 are practically identical to our main estimates.

6. Conclusions

In this paper we have provided an overview of the youth labor market in Spain over the last four decades and analyzed the importance of the labor market conditions at entry for the subsequent labor market outcomes of university graduates in Spain. We have highlighted a strong deterioration in employment rates, earnings, wages, and access to stable jobs over this period. Moreover, we have shown that young graduates have not taken advantage of the upgrading in the demand of skills, as their weight in high skills jobs did not increase.

In our empirical analysis we have found some evidence of scarring effects from adverse labor market conditions at entry, but the effects are smaller and less persistent than in most other studies. The explanation for this surprising result is a trend deterioration in the early labor market outcomes of university graduates. The proximate mechanism for this worsening trend is that in the aftermath of deep recessions, the labor market outcomes of entrants do not return to their pre-recession levels. We find significant declining trends in employment and wages over time that affect young workers with university degrees both at the time of entry to the labor market and during the first ten years of their working careers. Our results indicate that, rather than causing a temporary change in the earnings and employment profiles of certain unlucky cohorts of university graduates, deep recessions seem to provoke permanent changes in the youth labor market that negatively affect the outcomes of all future cohorts too.

In our view, future research should change its orientation, moving away from the scarring effects of recessions to an analysis of the forces that have contributed to the trend decline in the labor market outcomes of university graduates in Spain. One explanation that is consistent with the evidence presented here is the endogenous nature of labor reforms. The strong deterioration in the labor market outcomes of youth led the Spanish authorities to implement reforms during recessions that introduced more flexible rules for the hiring and firing of young workers. However, skill-biased technological change that increases the demand for skills other than those provided by the educational system, which delivers a composition of the cohorts of university graduates by fields of study with a low weight of STEM disciplines, is a potential explanation as well. As always, more research is needed.

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Appendix 1. Variable description

Our analysis of employment spells, their duration, and the earnings of university graduates after their graduation is based on a combination of data from the Continuous Sample of Working Lives (CSWL) for 2019 and the Labor Force Survey (LFS) for the period 1987-2019.

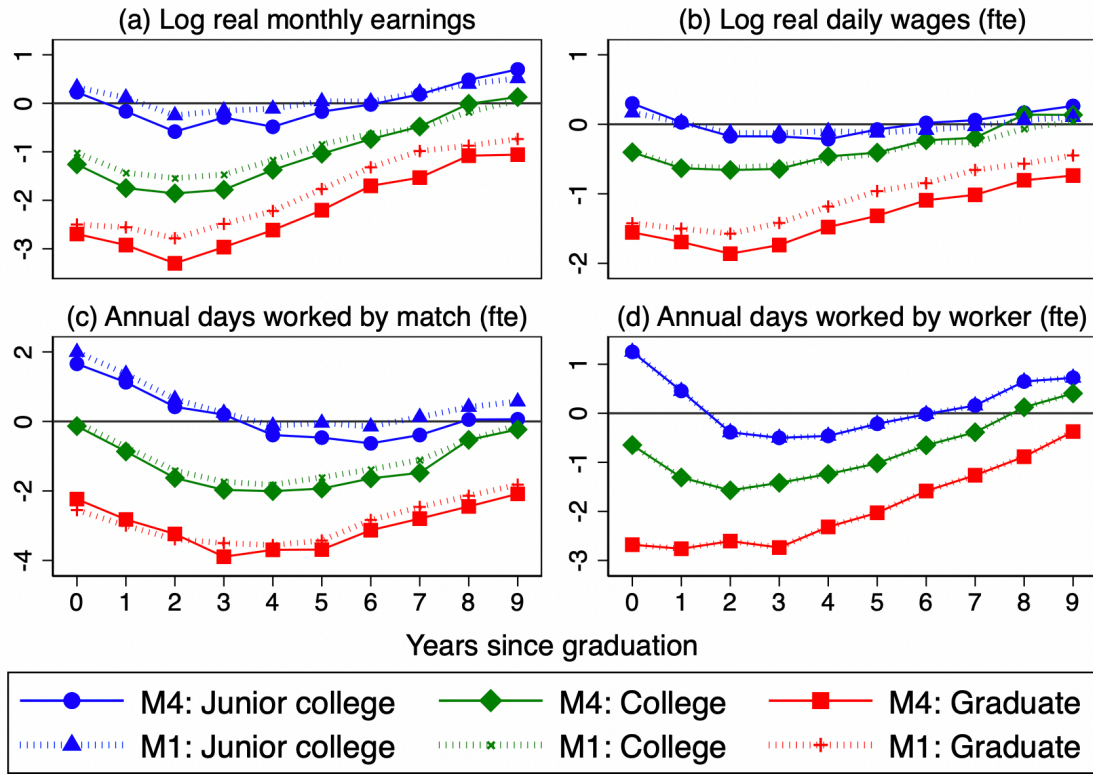
Date of graduation. The CSWL does not provide information on individuals' date of graduation. Thus, we obtain information on the age of graduation from the LFS and impute it to each individual in the CSWL. Specifically, from the LFS microdata files for 2014Q3-2020Q3 (every 6 quarters, which is the maximum period per individual, so that nobody appears more than once) we calculate the median year of graduation for each cell defined by the educational level (junior college, college, and graduate degree), gender, and the province and year of birth. The reason is that the average duration of the degrees depends not only on its level but also on the field of study, which in turn depends on the following variables: (1) The local offering of degrees: we assume that no mobility occurs until graduation, which is a sensible assumption since, according to the LFS, over the last 30 years almost 90% of all university students did their studies in their province of birth. (2) Gender: for example, there are more female students in health sciences and less in engineering. (3) Cohort: there have been changes in educational demand over time, but also changes in educational systems. In particular, as a result of the so-called Bologna process, college degree duration was reduced from five to four years and junior college duration was raised from three to four years. The generated database thus includes all years of degrees by educational level, year and province of birth and gender, from the year 1987 to the year 2019.

Days worked and earnings. We construct a panel all employer-employee matches or self-employment spells for every month since the year of graduation (year 0). To create this panel, for each month we compute the number of days worked in the match, the full-time equivalent days worked (i.e., days weighted by the coefficient of part-time work), the type of contract, the professional category, the monthly tax base (amount of earnings on which the social security tax is levied, which can be top and bottom coded), and, dividing by the number of days worked, the daily and full-time equivalent daily wages. The cells used in our analysis are obtained by collapsing this monthly information by year of graduation, calendar year, year of birth, province of birth, and gender, in the following way. (1) *Earnings:* in each cell, median wages are computed from the maximum (monthly or daily) tax base of each match in the 12 months of each calendar year. (2) *Days worked:* days of work in each match (only for employees) and days worked by each worker in all her/his jobs (including both as employee and self-employed) are computed as the average of the sum of all days worked in each match or for each individual in the calendar year. Earnings are deflated using the consumer price index with 1987 as the base year.

Appendix 2. Province of birth vs. province of first job estimates

The following graph presents the estimated coefficients in a specification in which the unemployment rate at entry to the labor market of the province of birth is replaced by the unemployment rate in the province in which the worker obtained his first job.

Figure A.2.1 Province of birth vs. province of first job estimates



Note: The estimated equation is as in Model 1.