General versus Job-Specific Skills and Gender Gaps in the Labor Market[*]

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Abstract

This paper shows that providing job-specific skills in high school, on top of general ones, can strongly enhance women's labor force attachment, especially among the low-educated. In 1990, the Spanish government postponed students' choice between general and vocational education from age 14 to 16. Exploiting the staggered implementation of this reform across provinces and cohorts, we identify three main effects on individuals in their twenties. First, the reform has no impact on either employment or wage prospects of men. Second, while the reform does not affect women's educational attainment, its full implementation leads to a 7 percent decrease in their labor force participation rate. Third, this effect is driven by low-educated women, meaning those who leave school at age 16 with at most basic general, and no occupational-specific skills. These findings suggest that ensuring a smooth transition from school to work is especially important for individuals with a weak attachment to the labor market, and few job options.

JEL codes: I26; I28; J24.
Keywords: general versus job-specific skills; gender occupational segregation; female labor supply.

1 Introduction

Female labor force participation has substantially increased in the last century to a current average level of 70 percent across OECD countries. However, this figure masks important differences across levels of education. While the labor force participation rate of women aged 25 to 64 with a tertiary degree is 85 percent, that of women with less than high-school education is only 55 percent. Put differently, there is a 30 percentage point gap between the labor force participation rate of highly- and low-educated women. The corresponding gap for men is only half of this (OECD 2016).[1] Economists have proposed several measures to increase the labor force participation of low-educated women, ranging from in-work benefits to affordable public childcare.[2] In this paper, we show that acquiring job-specific skills, on top of general ones, in high school may be especially beneficial to low-skilled women.

Whether, and to what extent students should receive some vocational training in school has often been a matter of discussion among scholars and policy makers. Equipped with occupation-specific skills, vocationally-trained students may find a job faster than those holding a general qualification. Yet, general education may become more useful during the life-cycle, by enhancing workers' ability to acquire further skills, and reducing their risk of unemployment. The terms of this trade-off may also differ for men and women. Female workers are primarily employed in semi-skilled occupations - such as hairdresser, nurse, or administrative staff - where some vocational training is an advantage, if not required.[3] Contrary to men, they also have a low attachment to the labor market, which implies that a rapid and smooth transition from school to work may be especially important for them.

This paper takes advantage of the gradual implementation of a Spanish comprehensive school reform to explore gender differences in the returns to job-specific skills. In December 1990, the Spanish government approved an ambitious law known under the acronym of LOGSE

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[1]The labor force participation rate of low-skilled and high-skilled men is, respectively, 75 and 93 percent, on average, across OECD countries.

[2]See, for instance, Blundell et al. (2016), Hoynes and Rothstein (2016), Haeck et al. (2015), and Cascio (2009).

[3]According to EU-SILC data, for instance, 50 percent of women in Europe work in semi-skilled white-collar occupations, while men are equally represented across a large variety of professions (EUROSTAT 2018).

(*Ley Organica de Ordenacion General del Sistema Educativo*) whose main goal was to provide an academically-oriented education to every student till the age of 16. To this end, it raised the compulsory school age and postponed students' choice between secondary general and vocational tracks from age 14 to 16. Crucially for us, the rise in the compulsory school age was done at the same time in all 52 provinces of Spain starting from the academic year 1991/92.[4] On the contrary, the government gave school districts up to 9 years to implement the de-tracking policy, and each of them did it at a different time, mainly because of space constraints. As a result, even within the same province, two different educational systems coexisted from 1992-93 to 2000-01.

To identify the impact of this reform on labor market outcomes of the affected cohorts, we estimate a difference-in-difference model that compares individuals who had a different probability of being exposed to the reform at age 14, depending on their province and year of birth. Our treatment variable corresponds to the share of students studying in the new system in each province and year, from 1992-93 to 2000-01. To obviate the non-random nature of this treatment, in addition to province and cohort fixed effects, our main specification controls for province-cohort varying factors that are likely to be correlated with the speed of implementation of the reform. These include share of left-wing municipalities, and province gdp during the year of implementation of the reform, as well as province-specific cohort size. Thus, our identification strategy relies on idiosyncratic province-to-year shocks in the implementation of the reform that should have no direct impact on the outcomes of interest. We also show that our results are robust to the inclusion of province-linear cohort trends. Besides, to indirectly check for parallel trends in the outcomes of interest, we test that the treatment variable has no significant impact on labor market outcomes of pre-reform cohorts.

To measure labor market status and occupational outcomes, we use the Spanish Labor Force Survey from 2000 to 2016, and link it to the treatment variable using respondents' year and province of birth. In this data set, we consider the affected cohorts when they are between

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[4]Note also that, already prior to the approval of this reform, 90 percent of students stayed in school beyond age 14, mainly because the minimum working age was set at 16.

the ages of 22 and 30.[5] Next, we take monthly wages from Social Security Data, available over the period 2006-2015. Thus, in our analysis, we mainly identify the short-term impact of this reform.

This analysis provides three main findings. First, men's labor market outcomes are not affected by this de-tracking reform. Secondly and in stark contrast to this first result, this policy has a strong negative impact on employment prospects of women. The full implementation of the reform[6] significantly reduces women's probability of being employed between the ages of 22 and 30 by 7 percentage points, or 14 percent compared to the mean for the last cohorts not affected by the reform (pre-reform mean hereafter). This effect mainly translates into a 4 percentage point decrease in labor force participation, or 7 percent compared to the pre-reform mean.

Third, this negative effect is especially strong and robust among women who only complete compulsory education. Note that, on average, the reform does not affect the composition of this group, as it does not alter women' educational decisions.[7] However, as a result of the reform, students who only complete compulsory education (low-educated hereafter) leave school with at most low general skills, and no occupational-specific skills. Our analysis shows that the full implementation of the new system significantly reduces the probability that low-educated women are employed between the ages of 22 and 30 by 35 percent relative to the pre-reform mean, with this effect being strongly statistically significant and statistically different from that on other women. Besides, this effect translates into a roughly equal and significant increase in both the probability of being unemployed and that of being inactive.[8]

To better understand the mechanisms behind these results, we focus on this group, which represents one quarter of the entire sample, and study their decisions from age 17 onward.

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[5]Note that by age 22, most of the individuals in our sample should have completed their educational investments.

[6]Meaning when the share of students in the new system goes from 0 to 1.

[7]In particular, in line with Felgueroso et al. (2014), we find that this reform has no impact on either women's decision to study beyond age 16 or their probability of pursuing academic studies beyond age 16, while it increases men's probability of dropping out at age 16.

[8]The impact on the probability of being unemployed is also statistically different between low-skilled women, and those who have at least a high-school degree. As for the effect on the probability of being inactive, the coefficients are not statistically different across the two groups. However, the one on low-skilled women is four times larger.

This analysis produces two additional insights. First, as these women enter the labor market, the reform does not affect their probability of being employed. However, it significantly decreases their likelihood of working in semi-skilled occupations, such as hairdresser, cook or administrative staff, and increases by an equal magnitude that of being employed in low-skilled jobs, such as shop assistant or cleaner.Second and consequently, over time such an occupational shift translates into an increased risk of being either unemployed or inactive.

To sum up, this comprehensive school reform has a strong negative impact on employment prospects of women who leave school with only some general education, and no job-specific skills. These results speak to the two recent studies suggesting that, at least for men, the relative benefits of general education over vocational training tend to materialize at older ages (Hampf and Woessmann 2017, Hanushek et al. 2017).[9] In this paper, we only identify short-term effects. Yet, we believe that low-skilled women, with poor job experience and increasing family responsibilities,[10] are unlikely to go back to the labor market at older ages. In other words, our findings suggest that these women may be unable to enjoy any long-term benefit of general education, if they permanently leave the labor market when struggling to find a stable employment at younger ages.[11]

As of men completing only compulsory education, we do not find evidence of a negative effect on them, and two reasons may explain why this is so. First, their labor force participation rate is up to 90 percent.[12] Permanently leaving the labor force is simply not an option most of these men consider. Second, already prior to the implementation of the reform, the majority of men with a vocational background were employed in a large variety of manual jobs that continue to be available for men with some general education, and no job-specific skills. Note

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[9]These studies adopt a difference-in-difference strategy that compares males' employment rates across education type and age. Note that the crucial identification assumption in this case is that the determinants of selection into different educational tracks are constant across cohorts. This identification strategy is also less suitable to look at women, as it cannot account for cohort-specific selection into work that characterizes female labor supply dynamics.

[10]Although the reform does not seem to affect marriage or fertility decisions, 26 percent of low-educated women, compared to only 6 percent of other women, already have children between the ages of 22 and 30.

[11]As for the general equilibrium effects of our results, note that in each province, the affected women represent at most 3 percent of working-age women. Thus, although we conduct only a partial equilibrium analysis, our findings are unlikely to have strong consequences on the local labor markets where these women reside.

[12]In comparison, that of low-educated women, belonging to pre-reform cohorts, is 10 percentage points lower.

that these results are in line with those of Malamud and Pop-Eleches (2010) and Malamud and Pop-Eleches (2011) who find - with the use of an RD design - that a de-tracking reform implemented in Romania in the 1970s did not change either men's educational investment or their employment prospects.[13]

Overall, our findings make important contributions to several strands of literature. To the best of our knowledge, this is the first paper that analyzes gender differences in the relative benefits of general and vocational education (Dustmann et al. 2017, Hampf and Woessmann 2017, Hanushek et al. 2017, Hall 2016, Hall 2012, Pekkala et al. 2013, Malamud and Pop-Eleches 2011, Malamud and Pop-Eleches 2010, Pekkarinen et al. 2009, Meghir and Palme 2005). While many scholars have nurtured this discussion, few have identified causal effects, and no one has provided evidence on the importance of this trade-off for women. To circumvent the issue of self-selection into different educational tracks, many studies have relied on comprehensive school reforms (Hall 2016, Malamud and Pop-Eleches 2010, Pekkarinen et al. 2009, Meghir and Palme 2005). However, many of these reforms have often been implemented at the same time in the entire country, or have coincided with other major changes of the educational system.[14] More importantly, most of these studies focus exclusively on men, mainly because female labor force participation was very low in the context analyzed.[15] Thus, our work fills an important gap in the literature studying the trade-off between general and vocational education.

Second, our results complement the literature studying the effectiveness of policies aimed at boosting labor force participation of low-skilled women, such as in-work benefits and public child care (Blundell et al. 2016, Hoynes and Rothstein 2016, Bauernschuster and Schlotter

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[13]On the other hand, exploiting a pilot scheme, Pekkarinen et al. (2009) find that, in the long run, a comprehensive school reform introduced in Finland in the 1970s enhanced inter-generational mobility of men. However, as the authors themselves admit, the mechanisms leading to this results are still unclear. In particular, while this reform also increases men's cognitive skills, the magnitude of the effect cannot fully explain the result on intergenerational mobility (Pekkala et al. 2013).

[14]Such as as a rise in the compulsory schooling age.

[15]As far as we know, only Dustmann et al. (2017), Hall (2016), Hall (2012)) consider the impact on both men and women of scenarios where the provision of vocational training in high school is reduced but not eliminated. Exploiting quasi-random shifts between a pure vocational and an intermediate track, induced by date of birth, Dustmann et al. (2017) find no evidence that attending a more advanced track leads to more favorable long-term outcomes for German students. Exploiting a pilot-scheme, Hall (2012) and Hall (2016) find that a reform that increased the general content of vocational programmes in Sweden, in the 1990s, did not affect either males' or females' educational attainment and labor market performance.

2015, Haeck et al. 2015, Blundell and Shephard 2011, Cascio 2009, Gelbach 2002, Eissa and Liebman 1996). In particular, we show that providing a mix of job-specific and general skills in school may be especially relevant for them. Third, this paper adds to the studies analyzing the topic of gender occupational segregation (Cortes and Pan 2018, Pan 2015, Blau et al. 2013). While we do not explore the causes of gender differences in occupational outcomes, we provide evidence on the consequences that these can entail. Finally, this paper contributes to the growing number of studies that analyze how gender gaps in the labor market depend on the type of educational investment made (Carlana 2018, , Buser et al. 2014, Andersen et al. 2013, Niederle and Vesterlund 2010). Most of these studies show that parents and teachers should help girls find their way into male-dominated fields, such as the STEM subjects. We demonstrate that there may be important gender differences in the returns to job-specific skills.

The paper proceeds as follows. Section 2 describes in detail the Spanish education system and the 1990 reform. Section 3 describes the data used to conduct our analysis and the empirical strategy we adopt. Section 4 presents key descriptive statistics for both affected and pre-reform cohorts. Section 5 shows the main results, while the following one describes a battery of robustness checks. Section 7 discusses the mechanisms behind the main results. In section 8, we illustrate additional findings. And section 9 offers concluding remarks.

2 The Spanish educational system

Until the end of the 1980s the Spanish education system was regulated by the *Ley* General de Educacion. In 1990, with the explicit aims of making education more inclusive, and raising the competitiveness of the workforce, the Spanish parliament approved a reform, the *Ley Organica de Ordenacion General del Sistema Educativo*, or LOGSE, whose two main elements are highlighted in figure 1.

First, this reform officially raised the compulsory schooling age from 14 to 16. Importantly, this was done in all Spanish provinces starting from the school year 1991/1992. Besides, as

shown in figure 2, the school enrollment rate at age 15 was already as high as 90 percent before the implementation of the reform. Note that already at that time the minimum working age in Spain was 16 years old. Moreover, students who did not obtain a degree of primary school could not leave school at age 15 and had to enroll into the lower secondary vocational track. These two elements should explain why we do not observe any sudden increase in the school leaving age in figure 2.

The second element this reform brought about was that of postponing students' choice between the vocational and academic track to age 16. To achieve this, it shortened the length of primary school from 8 to 6 years, and created a four-year track of lower secondary education, lasting from grade grade 7 (age 12) to grade 10 (age 16). This new comprehensive track took the name of Compulsory Secondary Education, or *ESO* in the Spanish acronym. As a result, only upon completion of *ESO*, could students chose whether to leave school, or to enroll into either upper secondary general education or a vocational program, both lasting two years. This de-tracking policy represented a drastic change for students who, in the absence of the reform, would have chosen to enroll in the vocational track at age 14. In the old system, lower secondary vocational programs lasted two years, and, as shown in figure 3, they offered several branches of professional specialization. While all of these gave some general background in Spanish, Math, a foreign language and civics, each of them was meant to provide students the basic skills to perform a specific job. On the contrary, the new comprehensive track mainly offered an academic curriculum up until age 16. Besides, the new vocational track available after compulsory education was not comparable to the old advanced one, given that most of the job-specific subjects had to be taught from scratch.

Recognizing that the implementation of the de-tracking reform required both the expansion and restructuring of many school buildings,[16] and the recruitment of new teachers, the government established a ten-year calendar for the introduction of the new system. According to this schedule, the track choice at age 14 should have disappeared by the school year 1998-99. Yet, school districts could anticipate the implementation of the de-tracking reform.

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[16]Figure A.1 in the appendix reports a series of maps showing the restructuring plans of the school buildings necessary to increase the hosting space.

As a result, even within the same province, two different educational systems coexisted from 1992-93 to 2000-01. In particular, while in the 1978 cohort, the first one to be affected by the reform, on average less than 6 percent of students were studying under the new system in each province, the reform got almost fully implemented when the 1986 cohort turned 14.

3   Data and empirical strategy

To identify the impact of this reform on labor market outcomes of the affected cohorts, we estimate a difference-in-difference model that compares individuals who had a different probability of being exposed to the reform at age 14, depending on their province and year of birth.

$$Y_{ipcy} = \gamma_p + \delta_c + \theta_y + \pi * X_{pc} + \beta * Treatment_{pc} + u_{ipcy} \tag{1}$$

where i is an individual born between 1978-1986, p stands for province of birth, c for cohort, and y for the year in which we observe i's labor market outcomes. Our treatment variable corresponds to the share of students studying in the new system in each province and year, from 1992-93 to 2000-01. To obviate the non-random nature of this treatment, in addition to province, γ_p and cohort fixed effects, θ_y, we control for province-cohort varying factors that are likely to be correlated with the speed of implementation of the reform. Specifically, the vector X_{pc} includes the share of left-wing municipalities,[17] and province gdp during the year of implementation of the reform, as well as province-specific cohort size. Thus, our identification strategy relies on idiosyncratic province-to-year shocks in the implementation of the reform that should have no direct impact on the outcomes of interest. A likely example would be a delay in school renovation plans due unexpected obstacles in construction works.

To construct the treatment variable, we rely on a series of annual reports published by the Ministry of Education and available on their online library. In detail, for each school

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[17]The reform had been approved by a left-wing government.

year between 1992-93 to 2000-01, and each of the 52 provinces of Spain, the Ministry's reports provide information on the number of students enrolled in the old vocational track, the number enrolled in the old academic track, and those attending the new comprehensive track. After digitizing these data, we have created our treatment as a continuous variable taking value from 0 to 1, and corresponding to the share of students enrolled in the new system, in each province and year, from 1992-93 to 2000-01.[18]

Figure 4 shows how the treatment variable evolves over time, while figure 5 depicts its geographical distribution in each year. Two things are worth noting from these graphs. First, in each cohort there is substantial variation across provinces in the implementation of the new system. Secondly, the speed of adjustment of each province varies across years, with some leading the implementation process one year, but falling behind in others, and vice versa.

Table 1 further shows how the treatment variable correlates with province observable characteristics. The variables we consider are a dummy equal to 1 for rural provinces, the province-cohort time-varying controls we include in regression 1, and province-cohort specific male and female employment rates. The treatment variable shows no clear pattern of correlation with either political or economic variables. However, rural provinces do seem to lead in the implementation of the reform in each year. Besides, the size of the 14 years old cohort is negatively correlated with the treatment variables. These patterns clearly call for the inclusion of these variables in our regression model.

To measure the outcomes of interest, we mainly use the 2000-2016 waves of the Spanish Labor Force Survey (LFS hereafter). In particular, from the LFS we draw information on highest level of education completed, labor market status - whether the respondent participates in the labor force, i.e. is active, and whether he/she is unemployed or employed - and two-digit occupation held for those who are employed. When using this data set, we restrict the estimation sample to individuals born between 1978 and 1986, and aged 22 to 30 when

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[18]For the cohorts born between 1978 and 1983, the Ministry of Education also provides these data disaggregated by grade, which allows us to compute the share of students enrolled in the new system in grade 3 - where students should enroll at age 14. As a robustness check, we will show that our results do not change when restricting the sample to the 6 cohorts for which we have such a detailed treatment.

interviewed.[19] Next, we measure (log) monthly wages from the Social Security Data set, available from 2006 to 2015.

For each of these data sets, each observation is linked to the treatment variable through the respondent's year and province of birth.[20] Finally, in all specifications, we use Huber-White standard errors clustered at the level of birth-province.[21]

4 Key descriptive statistics

Table 2 provides summary statistics for the estimation sample.[22] As a comparison, figure 6 and figure 7 offer a graphical representation of educational and labor market figures for the 1973-1977 cohorts, the last ones not to be affected by the reform.[23]

Several things are worth noting from these figures. First, as in many developed countries nowadays, Spanish women are more likely than men to have completed university. Secondly, and despite this, women in their twenties are significantly less likely than men to participate in the labor market. While such a gap can in part be explained by differences in the probability of being a full-time student, compared with men, women in their twenties are both more likely to have a partner, and to have children.[24] Third, in accordance with the literature on gender occupational segregation (Blau et al. 2013, Pan 2015), men and women are not equally represented across occupations. More importantly, while male workers have a high probability

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[19]We chose this age range for two reasons. First, students in Spain are expected to complete tertiary education by age 21, and we want to measure educational outcomes when the majority of individuals should have concluded their educational career. Second, we want to be able to observe all the 9 cohorts at the same ages, and the 1986 turns 30 in 2016. However, in some specifications, we also use the LFS waves from 1995 to 1999 to extend the analysis to respondents aged 17 to 21.

[20]Note that in the Labor Force Survey, two third of individuals in the affected cohorts live in their province of birth when attending high-school. Although using the province of birth to link LFS respondents to the treatment may introduce some measurement error, this allows us to circumvent any issue of endogenous migration.

[21]Spain has 52 provinces, which should be a sufficient number of clusters to obtain consistent standard errors. As a robustness check, we test that our results do not change when using Wild-bootstrap clustered standard errors. These results are available upon request.

[22]Figures A.2 and A.3 in the appendix also give a graphical representation of the evolution of the main variables of interest, over the period 2000-2016.

[23]To facilitate the comparison, we report educational and labor market outcomes of pre-reform cohorts when these are between 22-30. The graphs look very similar if constructed over the years 2000-2016, when our estimation sample is aged 22-30.

[24]However, fertility rates of Spanish women in their twenties remain very low compared with other developed countries.

of being employed in elementary, semi-skilled blue-collar and semi-skilled white-collar occupations, women are disproportionally concentrated in semi-skilled white-collar occupations, such as hairdressers, administrative jobs, nurses, cooks or waiters. Note that, in the majority of these jobs, some vocational background is an advantage, if not required. Accordingly, as shown in figure 3, the educational system offers different vocational programs aimed at providing job-specific skills. Yet, while in the old system, these were available already at age 14, with the de-tracking reform, students can only enroll in these courses at age 16.

In what follows, we will show that this plays an important role in explaining the effect of the reform.

5   Main findings

Table 3 and figure 8 show the main results of the paper. In table 3, panel A refers to women, while panel B presents the results for men. Each column refers to a different outcome, being this, respectively, the probability of being employed, that of being unemployed,[25] and that of being out of the labor force (inactive).

As shown in panel A, increasing the share of students enrolled in the new system from 0 to 1, or achieving the full implementation of the reform, significantly reduces women's probability of being employed between 22 and 30 by 7 percentage points, or 14 percent compared to the mean for the last cohorts not affected by the reform (pre-reform mean hereafter). This effect mainly translates into an increase in the probability of being inactive that significantly grows by 4 percentage points, or 15 percent compared to the pre-reform mean.[26]

On the contrary, the reform has no impact on men's employment prospects, at least in the short run. Furthermore, table 4 shows that the reform does not appear to have an effect on either men's or women's (log) monthly wages.

Figure 8 adds the second important piece of evidence of this analysis. The strong negative

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[25]Note that we measure this outcome for both active and inactive individuals. The reason for doing so is that we do not want to confound extensive margin effects with the specific impact of the reform on this outcome.

[26]Both coefficients are statistically different from the corresponding effects on men.

effect of the reform on female employment is mainly driven by low-skilled women, that is those who achieve only lower secondary education. Note that, on average, the reform does not affect the composition of this group, as it does not alter women's educational decisions.[27] However, as a result of the reform, this group leaves school without any job-specific skills, and at most only basic academic skills. Figure 8 tells us that the full implementation of the reform significantly reduces the probability that low-skilled women are employed between 22 and 30 by 17 percentage points, or 35 percent relative to the pre-reform mean, with this effect being strongly statistically significant and statistically different from that on other women.[28] Besides, this effect translates in a roughly equal and significant increase in both the probability of being unemployed and that of being inactive.[29]

Before delving into the potential mechanisms explaining these results, we first perform a battery of robustness checks, to ensure that we are truly identifying the impact of the de-tracking reform.

6 Robustness checks

To identify the effects of interest, we use difference-in-difference strategy that relies on the province-cohort variation in the implementation of the reform. Three assumptions should be satisfied in this setting to ensure the validity of this identification strategy. First, conditional on province and cohort fixed effects, and province-cohort time-varying factors that are correlated with the treatment variable, the residual source of variation should come from idiosyncratic shocks that have no direct impact on the outcomes of interest. Second, we should provide

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[27]Table A.1, in the appendix, shows that postponing students' track choice does not affect women's decision to study beyond age 16, while it seems to discourage male students from obtaining a lower secondary degree, as already shown by Felgueroso et al. (2014). On the other hand, on average, the comprehensive reform does not incite more students to pursue academic studies. Nor does it increase the probability that either male or female students are still studying in their twenties.

[28]To ease the reading of these results, in the main text of the paper we have chosen to provide a graphical representation of them. Table A.2 in the appendix, also reports the corresponding table of regression estimates. Note that over the age range 22-30, low-skilled women are more likely to participate in the labor market than those with at least a high-school degree. Such a gap completely reverses over the age range 25-34.

[29]The impact on the probability of being unemployed is also statistically different from that on other women, with a p.value of 0.07. As for the impact on labor force participation, although not statistically different from that on other women, it is four times larger.

some evidence that the parallel-trend assumption holds in this context. Third, we have to make sure that our results are not simply the effect of chance. To support these assumptions, we perform the following robustness checks.

In table 5, we show that the impact of the reform on women's labor supply does not change when including different sets of controls. The table reads as follows. Panel A refers to the probability of being employed, while panel B focuses on the probability of being out of the labor force. In the first column, we report our main results. In the second column, we exclude province-cohort time varying controls to show that our results do not depend on this set of controls. In the third column, we add province-linear-cohort trends. This is the most demanding specification, as it only exploits the province-cohort variation in the treatment variable in deviation from a province-specific trend. Next, in column four, we replace these variables with province-linear-year-of-interview trends to further show that the treatment variable is not capturing any province-specific dynamics. In the same spirit, in column five we include province-of-residence times year-of-interview fixed effects to further check that we are not capturing the impact of province-specific shocks, such as the financial crisis. Finally, in the last column, we exclude year fixed effects, and add controls for age and age squared. The main purpose of this specification is to check that our findings are not driven by cohort-year specific shocks, such as women's age at the outburst of the financial crisis. Remarkably, our results remain practically invariant across these different specifications. The only exception is the impact of the reform on the probability of being inactive that becomes insignificant when adding province-linear cohort trends. However, note that this effect remains significant when replacing province-specific trends with region-linear cohort trends.

To provide additional evidence that our identification strategy is not capturing province-specific trends, in table 6, we show that our main results are not affected by the inclusion of the leads of the treatment variable:

$$Y_{ipcy} = \gamma_p + \delta_c + \theta_y + \pi * X_{pc} + \beta * Treatment_{pc} + \sum_{k=-2}^{-1} \beta_k * Treatment_{pc-k} + u_{ipcy} \qquad (2)$$

Next, to check that the parallel-trend assumption holds in our context, in figure 9, we plot the distribution of the t-statistics associated to the following placebo reforms:

$$Y_{ipcoy} = \gamma_p + \delta_{co} + \theta_y + \pi * X_{pco}\beta * Treatment_{pco} + u_{ipcoy} \qquad (3)$$

where each of these regressions is estimated by assigning the treatment of cohort c and province p to individuals belonging to cohorts that are respectively, 9, 10, and up to 30 years older than the affected cohorts.[30] Two things are worth noting from these graphs. First, the t-statistics associated to the actual effect of the reform falls in the tail of this distribution. Second, around 10 percent of the effects associated to the placebo reforms are significant at 5 percent significance level. In large and independent samples, we would expect only 5 percent of these coefficients to be significant at 5 percent significance level. However, in this exercise we estimate only 21 regressions for each outcome, and each subsequent group of 9 regressions are correlated with each other. As a result, it is plausible to expect that more than 5 percent of these placebo reforms are estimated to be significant. Also, note that half of the significant coefficients have the opposite sign than the estimated impact of the true reform.

Next, in figure 10, we provide evidence that the effect we estimate is not simply a matter of chance. In detail, the left-hand side graph reports the distribution of the t-statistics associated to a series of 50 random reforms, estimated by reshuffling the treatment variable across different provinces, within the same cohort. The right-hand side graph repeats the same exercise, but this time we randomly reassign the treatment across different cohorts, within the same province. Remarkably, only 5 percent of the estimated coefficients are significant. Besides, in each graph, the t-statistics associated to the true reform falls in the tails of the distribution, which indicates that its effect is simply too large to be random.

In table 7 we bring additional evidence regarding the accuracy of our treatment. In our main specification this variable corresponds to the share of students enrolled in both grades

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[30]Note that we stop at 30 as the oldest cohort in this last regression already corresponds to the 1948 cohort.

3 and 4 of the lower secondary comprehensive track of the new system, in each province and year, from 1992-93 to 2000-01. However, for the cohorts born between 1978 and 1983, the Ministry of Education also provides these data disaggregated by grade, which allows us to compute the share of students enrolled in the new system in grade 3 (age 14). In table 7 we report the results obtained from the estimation of regression 1 on this restricting sample when aged 22 to 33.[31] As we can see these estimates are practically the same as those on the entire sample.

Finally, we have checked that our results are not driven by one specific cohort or province, do not depend on the age restrictions we make, are not sensitive to the use of survey weights, and remain significant using wild-bootstrap standard errors to correct for few clusters.

Overall, we believe that these robustness checks strongly support the validity of our identification strategy. As a next step, we have to explain what factors drive our results.

7 Potential mechanisms

In the previous paragraphs, we have shown that the 1990 de-tracking reform does not affect educational choices of women, but substantially worsen their labor market prospects. Besides, we have provided evidence that this effect is entirely driven by low-skilled women, that is women who quit school once they have completed only lower secondary education. These findings raise three questions. First, it would be interesting to explain why these women do not study longer. Secondly, it is crucial to dig into the mechanisms explaining these results. Third, we want to figure out why we do not find the same effect for low-skilled men. In this section, we provide both descriptive and causal evidence to answer all these questions.

We begin in table 8 where we compare socio-economic background and family outcomes of low-educated women, with those of women with at least a high-school degree.[32] Parents of low-educated women are more likely to be low-educated themselves, and have a higher probability of being unemployed, or working in low-skilled jobs if employed. Most likely, these women

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[31]Note that the 1983 cohort, the youngest in this sub-sample, is 33 in 2016.

[32]Note that the reform does not affect the probability of living with parents, or that of being in a relationship. On average, it has no impact on the likelihood of having children, either.

quit school relatively early to contribute to their family income. Besides, in their twenties, low-educated women have a higher probability of being married or cohabiting, compared with those who have at least a high-school degree. As for their partner's characteristics, these figures indicate a clear pattern of assortative mating. While the reform does not affect these outcomes on average, these figures suggest that it worsens the employment prospects of women who already have a disadvantaged socio-economic status.

To understand why the reform generates such an effect, we proceed by asking ourselves whether it has any impact on the occupational outcomes of low-skilled women. Figure 11 shows the occupational distribution of women belonging to the last five cohorts not affected by the reform - 1973-1977 - with a lower secondary vocational degree, when aged between 18 and 27.[33] In detail, this graph reports the distribution of jobs that employ up to three quarters of these women. Around 30 percent of female workers with a lower secondary vocational degree are employed in low-skilled occupations, especially as shop assistant.[34] However, the majority works in semi-skilled occupations, ranging from cooks and waiters, to hairdressers and administrative jobs.[35]

The common element of these semi-skilled professions is that holding some vocational training certification increases the chances of getting into these jobs. And this seems to be important to explain why the 1990 reforms worsens employment prospects of women who leave school only with basic general education. Figure 12 shows how the reform affects employment and occupational outcomes over women's age. In each graph, the first estimate represents the impact of the reform when low-skilled women are between 17 and 23, while the second dot

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[33]Here we consider a slightly different age spectrum than the one used in the estimation sample for two reasons. First, low-skilled women can start working as soon as they finish school, that is from age 17 onwards. Around 40 percent of the 1973-1977 group of low-skilled women is indeed in the labor force between age 18 and 21. Secondly, till 1999 in the LFS we can precisely measure whether a respondent's highest level of education is the oldest lower secondary vocational degree. At present we only have the LFS from 1995, and hence we can recover this information for the 1973-1977 cohorts between 1995 and 1999, when they are between 18 and 27. Importantly, the occupational distribution does not change when including more cohorts. However, we chose these 5 cohorts to increase the chances of having a reasonably comparable group for our affected cohorts.

[34]Shop assistant is generally considered to be a semi-skilled job. We classified it as low-skilled as no specific vocational training is needed to perform this job.

[35]The gap between women's employment rates in low-skilled and semi-skilled occupations appears even larger if computed on the entire distribution of jobs.

corresponds to the effect of the reform between age 24 and 30.[36] The occupational outcomes correspond to those jobs in which the 1973-1977 female workers with a lower secondary vocational degree are mostly employed, that is semi-skilled and low-skilled occupations. Taken together, these estimates tell us the following. In their first years in the labor market, the full implementation of the reform does not affect the employment prospects of low-skilled women. However, it significantly decreases the probability that they are employed in semi-skilled occupations, while increasing by an equal magnitude their likelihood of working in low-skilled jobs. The estimated effects imply that the full implementation of the reform decreases (increases) the probability that low-skilled women work in semi-skilled (low-skilled) occupations by one third relative to the pre-reform mean. Over time, this effect vanishes, as the reform increases the probability that women are either unemployed or inactive.[37] All the coefficients are statistically different between the two age groups.[38]

Figure 13 reproduces these results in a series of graphs in which we successively enlarge the age group to better observe the dynamics of the effects. Remarkably, the estimated occupational shift seems to diminish precisely as the probability of being employed decreases. In our sample, among low-educated women who do not work, up to 50 percent used to be employed in a low-skilled occupation, while women working in low-skilled occupations only represent 43 percent of employed low-skilled women. Furthermore, women previously holding a low-skilled job are have a 12 percent higher probability of being out of the labor force than those who used to work in semi-skilled professions.[39] In other words, the reform increases the probability that low-educated women work in occupations characterized by a high job-leaving rate and low re-employment opportunities. Finally, although not significant, the point estimates in the last graph of figure 13 suggest that, as these women struggle to find a job,

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[36]All these results are obtained from the estimation of regression 1 over the period 1995-2016. We consider low-skilled women from age 17 onwards, as they can potentially start working at this age. Their labor force participation rate is already 40 percent between 17 and 23.

[37]Importantly, while the sample of low-educated women shrinks over time, as some acquire further education, we checked that the composition of this group is not affected by the reform in either of the two age groups.

[38]In table A.4 in the appendix, we also report the impact on all these outcomes, estimated on the entire sample of low-skilled women aged 17 to 30. Although not significant, the point estimates in columns 1 and 2 of panel B also point to the occurrence of an occupational shift.

[39]These figures are, respectively, 46 percent for low-educated women previously employed in low-skilled jobs, and 41 percent for those previously working in semi-skilled jobs.

they become more likely to have children.

We conclude this section by looking at low-skilled men. In principle, the reform may also lead male workers with basic general education to experience such an occupational switch, in comparison to low-skilled men with a vocational degree. However, the crucial point is to understand where the latter are employed. Figure 14 replicates figure 11 for the case of 1973-1978 men, aged 18 to 27, with a lower secondary vocational degree. Remarkably, low-skilled male workers with a vocational education are equally likely to be employed in semi-skilled and low-skilled occupations.

Accordingly, figure 15 shows that the reform has no impact on any outcome of affected cohorts of low-skilled men, either at younger ages or later.[40] Basically, the variety of manual jobs where low-skilled men with vocational education work continue to be available for men with lower secondary general education.

8   Additional findings

In the old educational system, students who want to pursue vocational studies tend to enroll in this track already at age 14. On the contrary, under the new system, students can only enroll into the vocational track at age 16.[41] In other words, they enter the labor market with at least two additional years of general education.

As argued by Hampf and Woessmann 2017, a richer bundle of skills may eventually prove to be useful for these students in the labor market. In particular, general education may increase workers' ability to acquire further skills, and help reduce the risk of unemployment.

In table 9, we test this hypothesis, by estimating regression 1 on the sample of affected cohorts whose highest level of education is either an upper secondary vocational degree, or a post-secondary professional degree. Panel A presents the results of this exercise for women,

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[40]In table A.5 in the appendix, we also report the aggregated effect over the age range 17 to 30. Interestingly, the reform also seems to decrease the probability that low-skilled men are in the labor market, and the point estimates for the occupational outcomes do suggest that some occupational switching may be taking place for low-skilled men as well. However, the estimated impact on labor force participation is only marginally significant and very small in magnitude.

[41]As above, the composition of this group is not affected by the reform, on average.

while panel B reports those on men. In both cases, we consider respondents who are between 22 and 30, over the years 2000-2016. The first three columns refer to the extensive margin, while the last three focus on occupational outcomes. These correspond to the low-skilled, semi-skilled and high-skilled professions where 1973-1977 respondents[42] with an advanced vocational degree are employed.

The estimates in Panel A suggest that, if anything, the reform worsens employment prospects of this group of women, too. Most likely, some of them may also struggle to find a job with fewer years of vocational training, as this means less opportunities to do internships, getting to know firms, and potential employers. However, note that the negative effect on the probability of being employed is not robust across different specification, which implies that these results should not be over-interpreted.

As for men, the reform has no impact on them, either at the extensive or at the intensive margin. Note that the results on the extensive margin are in line with those of Malamud and Pop-Eleches (2010) and Malamud and Pop-Eleches (2011) who also find that a comprehensive reform implemented in Romania in the 1970s had no effect on men's employment prospects or earnings.[43] On the contrary, the authors find that the Romania's reform decreased men's probability of working in manual or craft jobs. Most likely, this difference is due to the fact that in Spain there were plenty of these jobs, at least when the affected cohorts entered the labor market.

More in general, these results are consistent with those of Dustmann et al. (2017) for Germany, and Hall (2016), and Hall (2012) for Sweden. All these studies compare employment prospects of vocationally-trained students and those attending academically-oriented vocational programs. As in those contexts, our results suggest that increasing the general context of vocational tracks, without eliminating them, has neither a positive nor a negative effect on labor market performance.

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[42]The cohorts just slightly older than the affected ones.

[43]Although we do not show these results here, we do not find any impact on earnings either. These findings are obtained with the use of Social Security Data for the period 2006-2015, and are available upon request.

9 Summary and concluding remarks

Across OECD countries, there exists an average 30 percentage point gap between the labor force participation rate of high-skilled and low-skilled women. An extensive literature has documented that women's economic disadvantage has negative knock-on effects on their children cognitive, non-cognitive, and health outcomes (Persson and Rossin-Slater 2018, Autor et al. 2016, Aizer and Currie 2014, Currie 2011). Consequently, closing such a gap is as urgent as reducing the gender wage gap at the top of the earning distribution. Economists have proposed several measures to increase labor force participation of low-educated women, ranging from tax benefits such as the Earned Income Tax Credit in the United States (EITC) to affordable public child care. However, we seldom consider that, compared to men, the majority of women tend to work in semi-skilled occupations, where some vocational background is useful, if not required. In this paper, we study whether acquiring a mix of job-specific and general skills in school may be especially beneficial to low-skilled women.

In 1990, the Spanish government introduced a reform that postponed students' choice between the vocational and academic track from age 14 to 16. Exploiting the staggered implementation of this reform across provinces and time, we show that, by weakening the connection between school and the labor market, such a policy has a strong and long-lasting negative impact on employment prospects of women who leave school at age 16, with only some general education, and no occupational-specific skills.

To conclude, a few considerations are worth mentioning. First, in this paper we have argued that the Spanish comprehensive school reform has not affected employment prospects of low-educated men, partly because the male occupational distribution is more sparse than the female one, and partly because men have a stronger attachment to the labor market than women. Since the outburst of the financial crisis, the rate of male teenagers who are not in education, employment or training, or NEETs, has substantially grown in all OECD countries (OECD 2017). In other words, staying out of the labor force is becoming an option men consider as well. As a result, ensuring a smooth transition from school to work may have become as important for men, as it is for women. Secondly, while in this paper we are

analyzing the case of Spain, our results should be important for all those countries, such as the United States or the United Kingdom, where compulsory education is mostly academically-oriented. And they should be especially relevant in those contexts where a comprehensive compulsory education system coexists with a large high-school dropout rate.

As for the policy implications of this paper, our findings suggest that work-based learning opportunities can be especially useful for students who struggle in school (Wolter and Ryan 2011). However, as the rate of depreciation of job-specific skills is likely to be higher than that of general skills, it is also necessary to reduce existing gaps in access to on-the job training opportunities between sexes, levels and types of education. Finally, as many jobs are being automated (Autor 2015, Black and Spitz-Oener 2010), it is equally important to bring men into female-dominated jobs, such as nurses or other personal care jobs, and tackle the overall gender occupational segregation to expand the employment opportunities of both sexes (Blau et al. 2013, Cortes and Pan 2018).

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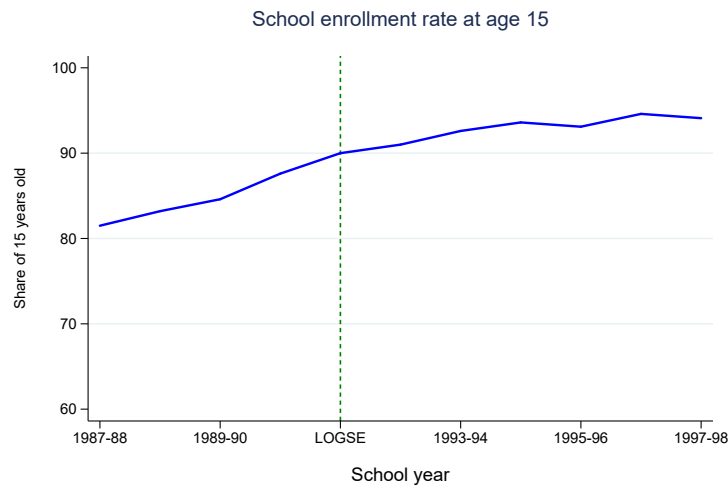
10   Graphs and tables

Figure 1: **The educational system before and after the reform**
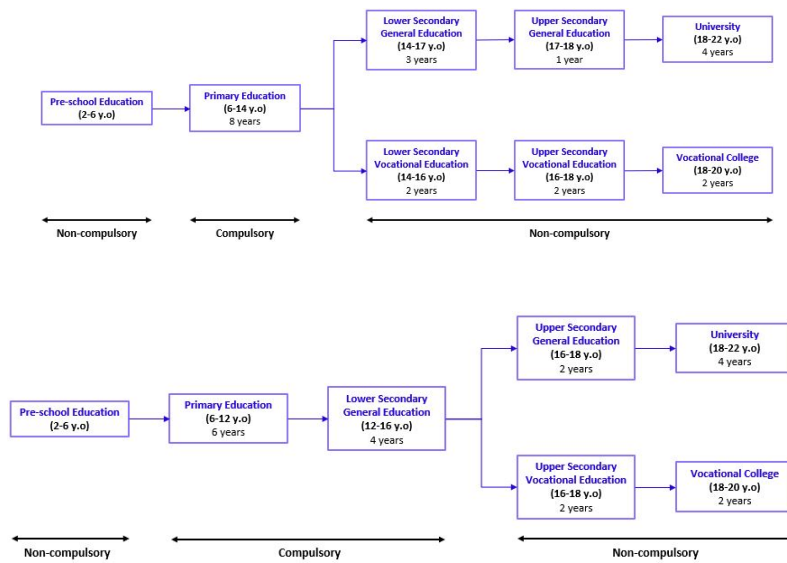
Source: Spanish Ministry of Education.
Note: This figure presents a schematic representation of the Spanish educational system. The top panel represents the old system, while the bottom one concerns the new one.
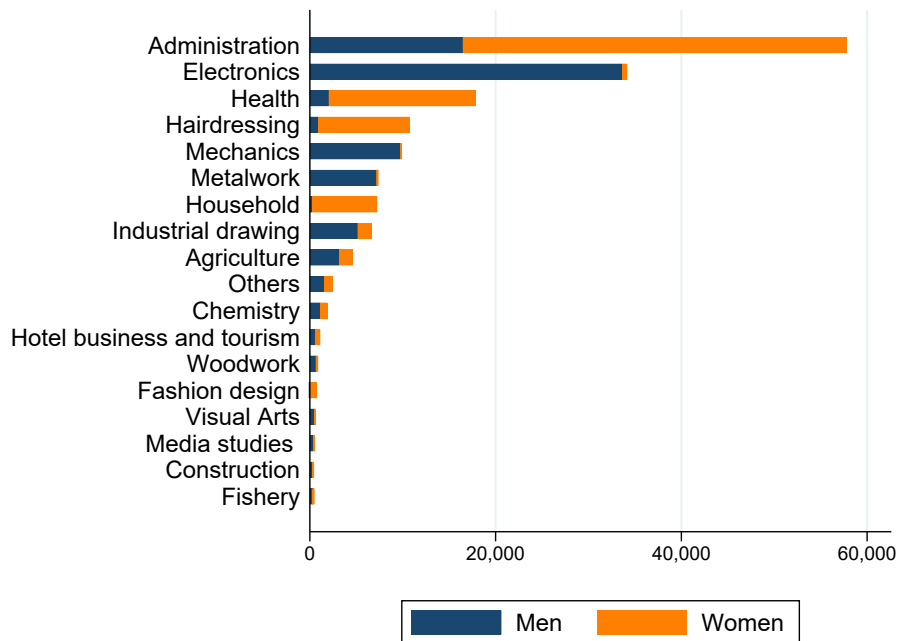
Figure 2: **School enrollment rate at age 15**

School enrollment rate at age 15

Note: This figure presents the evolution of the school enrollment rate at age 15 around the period of implementation of the reform.

Figure 3: **List of vocational programs - school year 1985-86**

Notes: This figure presents the different branches that are available to students enrolling in vocational programs. In the old system, these are available both at lower secondary (14-16) and upper secondary level (16-18). In the new system they are only available at upper secondary level. As an example, the graph also reports the gender distribution across these branches. Although these specific data refer to the school year 1985/1986, this distribution is very stable over time.
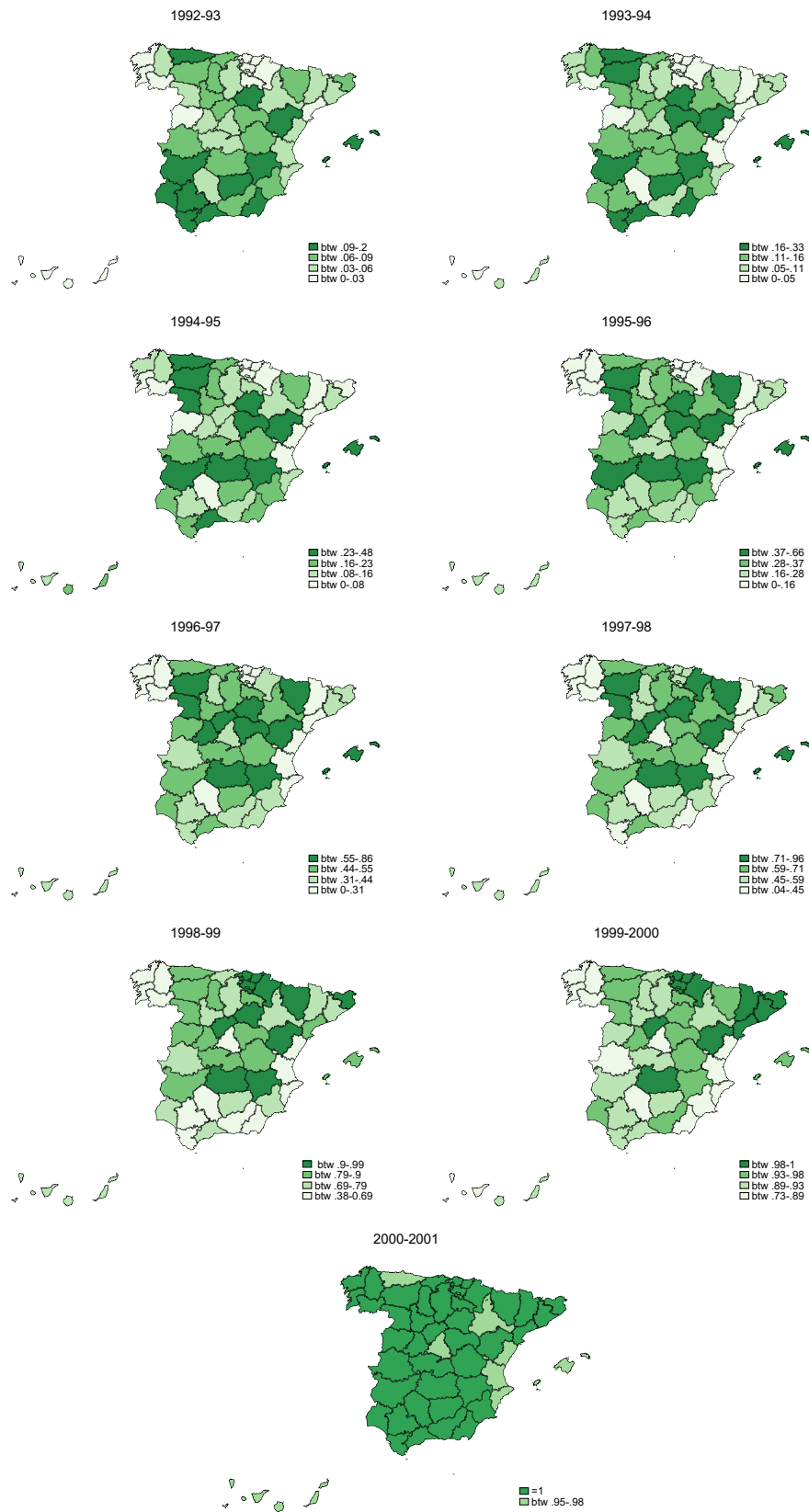
Figure 4: **Evolution of the treatment over the years of implementation**

Share of students in the new system
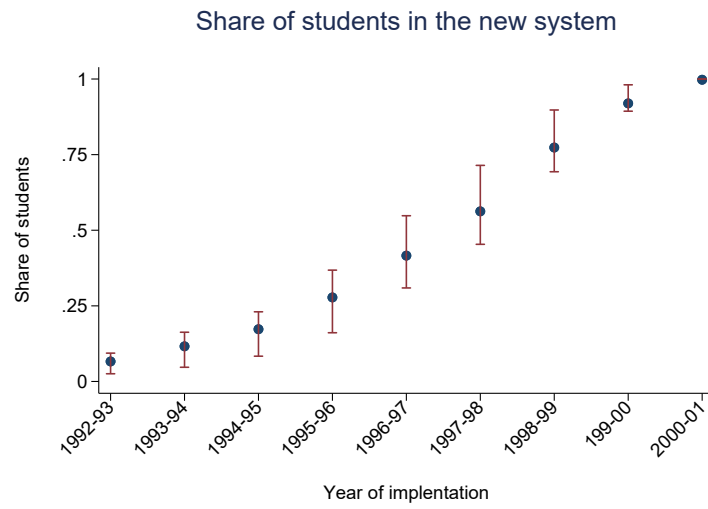
Source: Spanish Ministry of Education.
Notes: This figure presents the evolution of the treatment over the years the reform has been implemented. In detail, each dot refers to the average share of students enrolled in the new system, from 1992-93 to 2000-01. The difference between the 25th and 75th percentiles (interquartile range) for each year is also reported.

Figure 5: **Geographical distribution of the treatment**

Source: Spanish Ministry of Education.
Notes: This figure presents the geographical distribution of the treatment across different cohorts. In detail, each map refers to a specific year of implementation of the reform, and shows the share of students enrolled in the new system in each province.

Figure 6: **Educational distribution by gender - pre-reform cohorts**
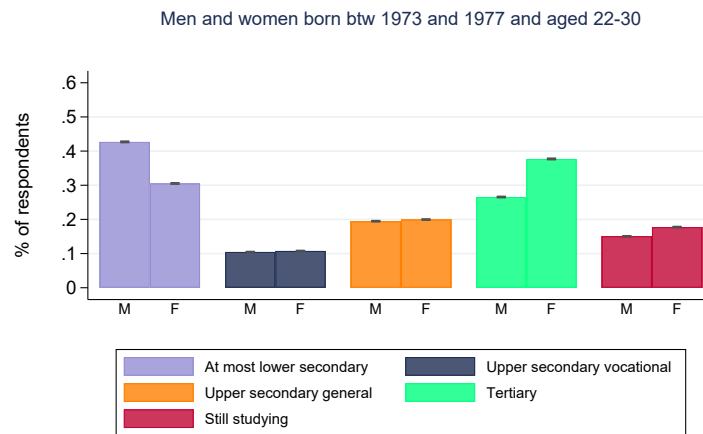
Men and women born btw 1973 and 1977 and aged 22-30

Sample: respondents born btw 1973 and 1977 and aged 22-30.
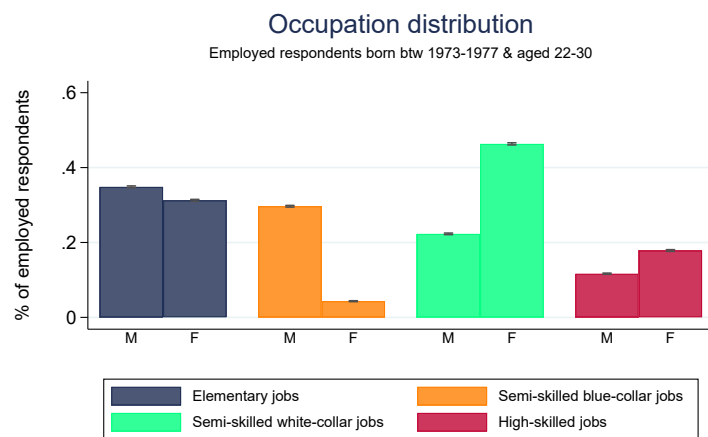
Observations: men=239395 ; women=226218.

Source: Spanish Labor Force Survey 1995-2016.

Notes: This figure presents the educational distribution of the last five cohorts not affected by the reform. In detail, it reports the share of LFS respondents born between 1973-1977 and age 22-30, whose highest level of education is, respectively, lower secondary, upper secondary vocational, upper secondary general, or tertiary education. The last figure shows the fraction that is still studying in this age range. "M" refers to men, while "F" stands for women.

Figure 7: **Labor market and occupational outcomes by gender - pre-reform cohorts**

Labor market outcomes
Men and women born btw 1973 and 1977 and aged 22-30

Legend: Labor force participation, Unemployment, Employment

Sample: LFS respondents born btw 1973 and 1977 and aged 22-30.

Observations: men=239395 ; women=226218.

Occupation distribution
Employed respondents born btw 1973-1977 & aged 22-30

Legend: Elementary jobs, Semi-skilled blue-collar jobs, Semi-skilled white-collar jobs, High-skilled jobs

Sample: respondents born btw 1973-1977 and aged 22-30.

Observations: men=161211 ; women=115428.

Source: Spanish Labor Force Survey 1995-2016.

Notes: This figure presents labor market outcomes and the occupational distribution of the last five cohorts not affected by the reform. In detail, the first graph reports the labor force participation, unemployment, and employment rate of LFS respondents born between 1973-1977, and aged 22-30. The second graph reports the share of employed respondents in these cohorts working in elementary, semi-skilled blue-collar, semi-skilled white-collar, and high-skilled occupations. "M" refers to men, while "F" stands for women.

Figure 8: **Impact of the reform on women's labor market outcomes by level of education**
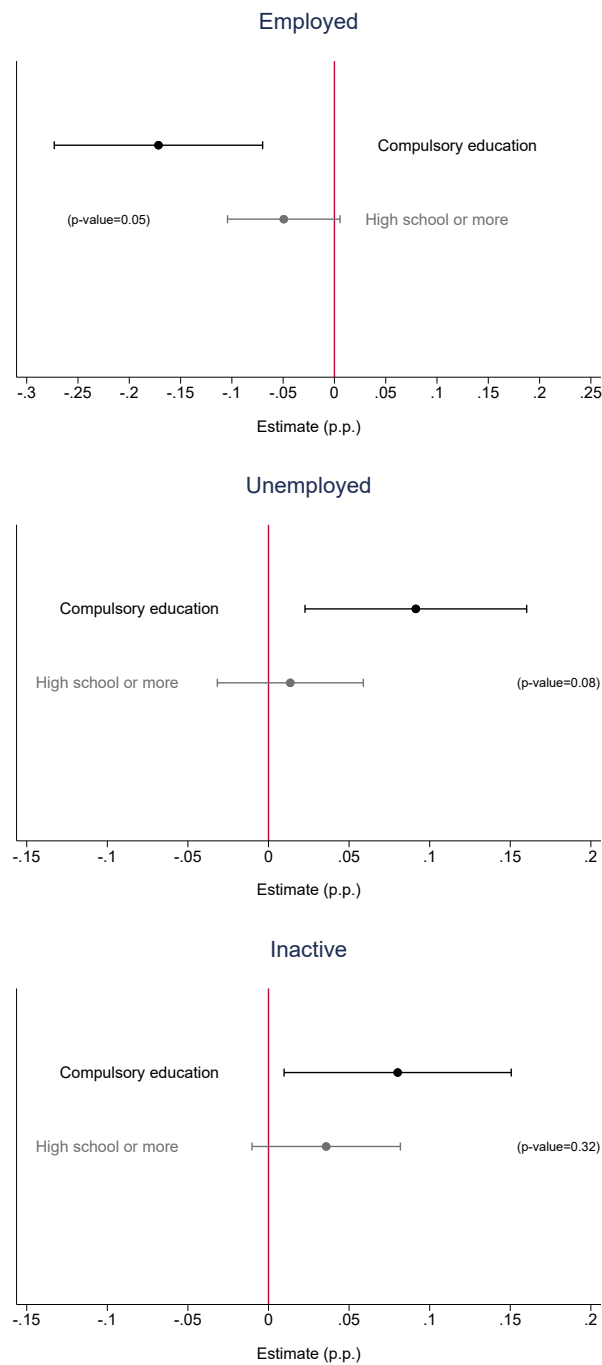
Employed

Unemployed

Inactive

Source: Spanish Ministry of Education and Spanish Labor Force Survey 2000-2016.
Notes: These graphs report the heterogeneous impact of the reform on women's labor market outcomes by level of education. The two subgroups considered are women with at most lower secondary education (age 16), and women with at least a high-school degree. The results are obtained from the estimation of regression 1 where all regressors are also interacted with a dummy for women with at least a high-school degree. Controls include cohort, birth-province and year fixed effects. The estimation sample comprises women born between 1978 and 1986, and aged 22 to 30 between 2000 and 2016, for a total of 296,327. Standard errors clustered at the level of birth province are used in these regressions. 95 percent confidence interval, and p-values of the t-test on the equality of the two coefficients are also displayed in the graphs.
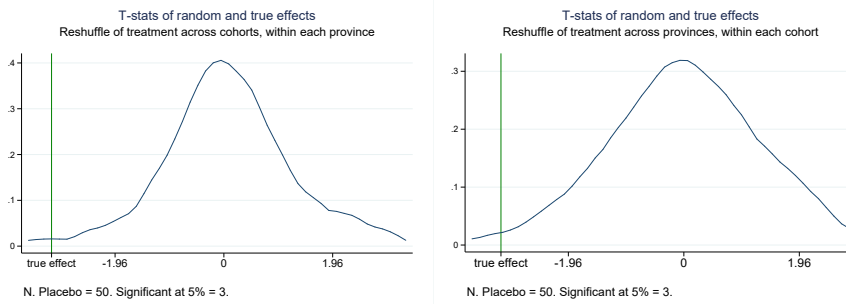
Figure 9: **Placebo reforms - cohorts 9-30 years older**
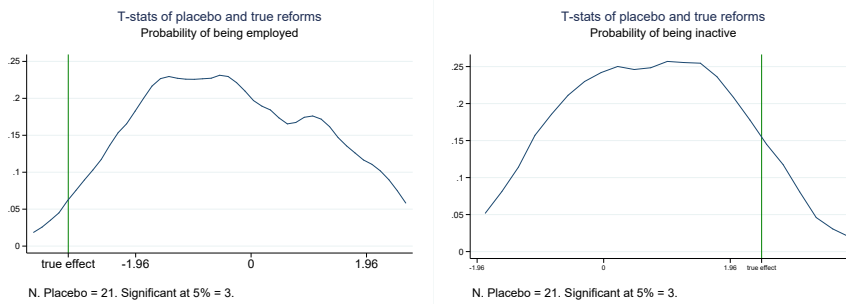
Source: Spanish Ministry of Education and Spanish Labor Force Survey 2000-2016.
Notes: These graphs report the distribution of t-statistics associated to the impact of a series of placebo reforms. Each of these regressions is estimated by assigning the treatment of cohort *c* and province *p* to individuals belonging to cohorts that are respectively, 9, 10, and up to 30 years older than the affected cohorts. The left-hand side graph refers to the probability of being employed, while the right-hand side graph focuses on the probability of being out of the labor force

Figure 10: **Reshuffle of treatment across provinces and cohorts**

Source: Spanish Ministry of Education and Spanish Labor Force Survey 2000-2016.
Notes: These graphs report the distribution of t-statistics associated to the impact of fake reforms. In detail, the left-hand side graph reports the distribution of the t-statistics associated to a series of 50 random reforms, estimated by reshuffling the treatment variable across different provinces, within the same cohort. The right-hand side graph repeats the same exercise, but this time we randomly reassign the treatment across different cohorts, within the same province.
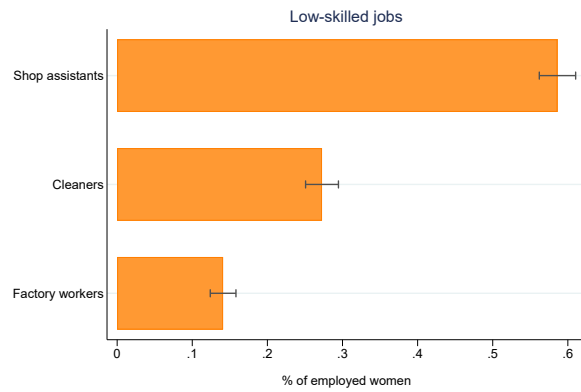
Figure 11: **Occupational distribution - pre-reform women with lower secondary vocational education**
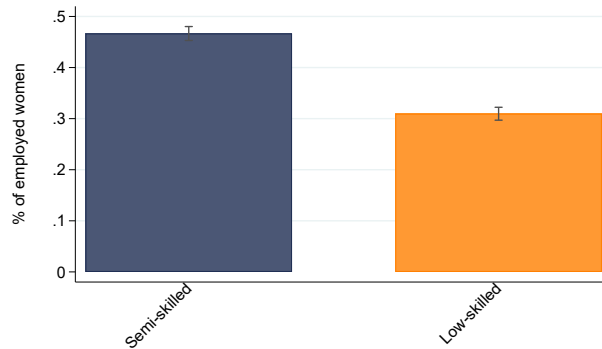
Sample: 1973-1977 employed women with lower secondary vocational education.
Observations: 5152.
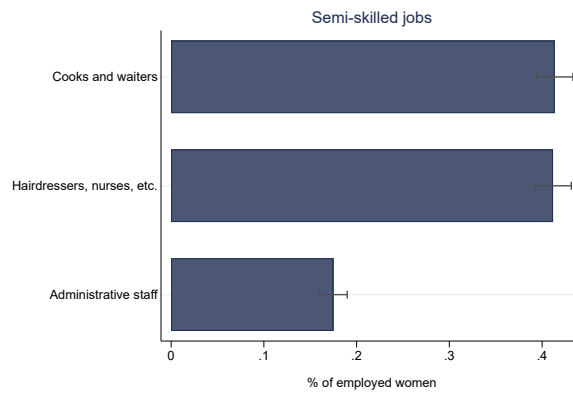
Sample: 1973-1977 women with lower secondary education, employed in semi-skilled jobs.
Observations: 2404.

Sample: 1973-1977 women with lower secondary education, employed in low-skilled jobs.
Observations: 1595.

Source: Spanish Labor Force Survey 1995-1999.
Notes: This figure presents the occupational distribution of the last five cohorts of women that are not affected by the reform, and whose highest level of education is lower secondary vocational education. In detail, it reports the mean employment rate in occupations that employ three quarters of LFS female respondents born between 1973-1977, with this level of education, when aged 18 to 28. Note that the LFS provides information on this specific level of education only between 1995-1999, when 1973-1977 cohorts are between 18 and 28.

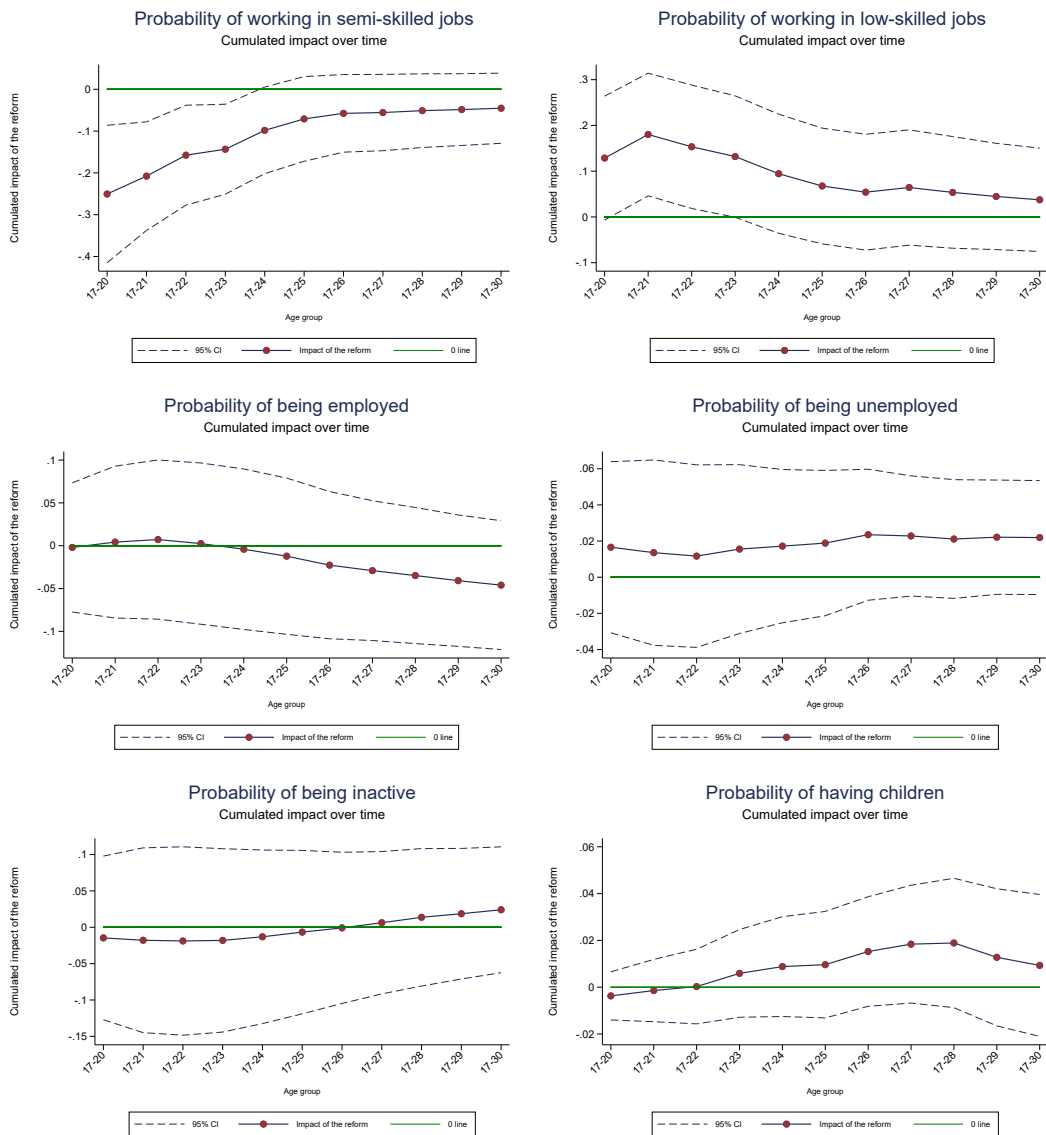Figure 12: **Impact of the reform on low-skilled women by age group**

Semi-skilled jobs - women with lower secondary education
Impact by age group

(p-value=0.05)

Sample: employed women with lower secondary education, born btw 1978-86.
Observations. age 17-23: 33820; age 24-30: 29928.

Low-skilled jobs - women with lower secondary education
Impact by age group

(p-value=0.05)

Sample: employed women with lower secondary education, born btw 1978-86, aged 17-30.
Observations. age 17-23: 33820; age 24-30: 29928.

Employed - women with lower secondary education
Impact by age group

(p-value=0.02)

Sample: women with lower secondary education, born btw 1978-86, aged 17-30.
Observations. age 17-23: 137598; age 24-30: 55171.

Unemployed - women with lower secondary education
Impact by age group

(p-value=0.03)

Sample: women with lower secondary education, born btw 1978-86, aged 17-30.
Observations. age 17-23: 137598; age 24-30: 55171.

Inactive - women with lower secondary education
Impact by age group

(p-value=0.43)

Sample: women with lower secondary education, born btw 1978-86, aged 17-30.
Observations: age 17-23 137598; age 24-30: 55171.

Source: Spanish Ministry of Education and Spanish Labor Force Survey 1995-2016.
Notes: This figure presents the estimated impact of the reform on labor market and occupational outcomes of
low-skilled women, born between 1978 and 1986, when aged between 17 and 30. In each graph, the first estimate
refers to the impact on the sample of low-skilled women aged 17-23, while the second one concerns low-skilled
women aged 24-30. 95 percent confidence bands are also reported. Low-skilled and semi-skilled occupations
are those that employ three quarters of pre-reform women with lower secondary vocational education when
aged 18-28, as depicted in figure 11. As for labor market outcomes, they measure, respectively, the probability
of being employed, that of being unemployed, and that of being out of the labor force.
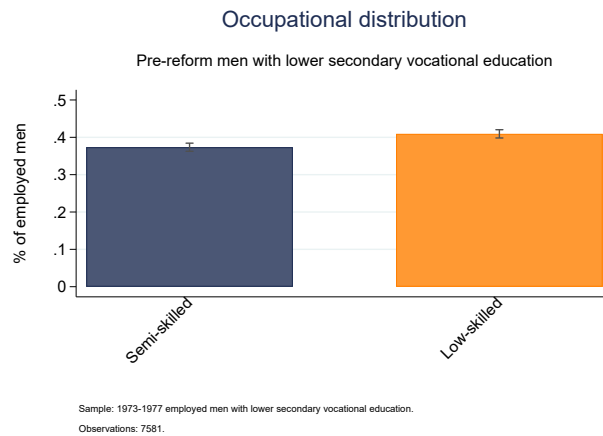
34

Figure 13: **Impact of the reform on low-skilled women over time**

Source: Spanish Ministry of Education and Spanish Labor Force Survey 1995-2016.

Notes: This figure presents the estimated impact of the reform on labor market and occupational outcomes of low-skilled women, born between 1978 and 1986, when aged between 17 and 30. In each graph, the first dot represents the impact on women aged 17-20, then the age range of the estimation sample is progressively enlarged. 95 percent confidence bands are also reported. Low-skilled and semi-skilled occupations are those that employ three quarters of pre-reform women with lower secondary vocational education when aged 18-28, as depicted in figure 11. As for labor market outcomes, they measure, respectively, the probability of being employed, that of being unemployed, and that of being out of the labor force.
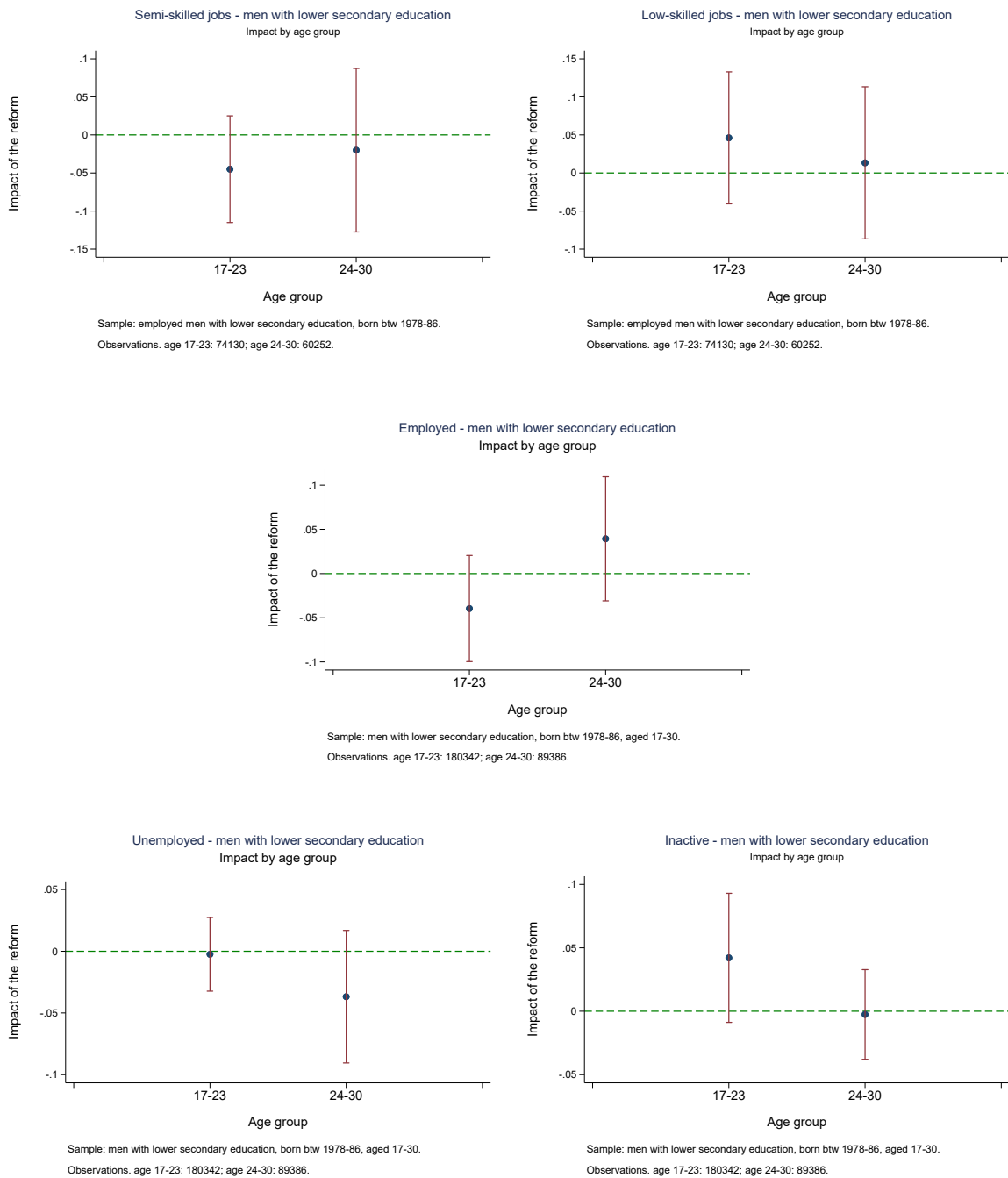
Figure 14: **Occupational distribution - pre-reform men with lower secondary vocational education**

Occupational distribution

Pre-reform men with lower secondary vocational education

Sample: 1973-1977 employed men with lower secondary vocational education.
Observations: 7581.

Source: Spanish Labor Force Survey 1995-1999.

Notes: This figure presents the occupational distribution of the last five cohorts of women that are not affected by the reform, and whose highest level of education is lower secondary vocational education. In detail, it reports the mean employment rate in occupations that employ three quarters of LFS female respondents born between 1973-1977, with this level of education, when aged 18 to 28. Note that the LFS provides information on this specific level of education only between 1995-1999, when 1973-1977 cohorts are between 18 and 28.

Figure 15: **Impact of the reform on low-skilled men by age group**

Source: Spanish Ministry of Education and Spanish Labor Force Survey 1995-2016.
Notes: This figure presents the estimated impact of the reform on labor market and occupational outcomes of low-skilled men, born between 1978 and 1986, when aged between 17 and 30. In each graph, the first estimate refers to the impact on the sample of low-skilled men aged 17-23, while the second one concerns low-skilled men aged 24-30. 95 percent confidence bands are also reported. Low-skilled and semi-skilled occupations are those that employ three quarters of pre-reform men with lower secondary vocational education when aged 18-28, as depicted in figure 11. As for labor market outcomes, they measure, respectively, the probability of being employed, that of being unemployed, and that of being out of the labor force.

Table 1: **Correlation between the treatment and province-cohort variables**

	(1) 1992-93	(2) 1993-94	(3) 1994-95	(4) 1995-96	(5) 1996-97	(6) 1997-98	(7) 1998-99	(8) 1999-00
Rural province	0.00790 (0.0143)	0.0218 (0.0230)	0.0445 (0.0314)	0.0900** (0.0435)	0.164*** (0.0550)	0.139** (0.0571)	0.0645 (0.0441)	0.0215 (0.0195)
Cohort size	-0.00951 (0.00719)	-0.0203* (0.0116)	-0.0460*** (0.0152)	-0.0799*** (0.0207)	-0.111*** (0.0269)	-0.124*** (0.0266)	-0.0790*** (0.0209)	-0.0267*** (0.00982)
Share of left-wing mun.	0.0894** (0.0349)	0.118** (0.0575)	0.136* (0.0803)	0.100 (0.0930)	0.115 (0.123)	-0.0403 (0.125)	-0.128 (0.0917)	-0.114*** (0.0390)
Gdp per capita	-0.0703** (0.0335)	-0.115** (0.0552)	-0.144* (0.0760)	-0.190* (0.108)	-0.172 (0.145)	0.0945 (0.146)	0.269** (0.103)	0.117** (0.0451)
Observations	52	52	52	52	52	52	52	52

Source: Spanish Ministry of Education and Spanish Labor Force Survey.

Notes: this table reports the correlation between the treatment variable and province-cohort observable characteristics. In detail, each row refers to a specific province observable characteristic. Each column refers to a single year - from 1992-93 to 1999-2000 - and presents the estimate of a regression of the share of students enrolled in the new system in that year on a constant, and that specific province characteristic. The regression for the school year 2000-01 is not reported, as there is little variation in the treatment in that year.

*** p<0.01, ** p<0.05, * p<0.1.

Table 2: **Summary statistics - affected cohorts aged 22-30**

	(1) Men	(2) Women	(3) Difference
Educational outcomes			
Lower secondary vocational	0.39	0.25	0.14***
Upper secondary vocational	0.11	0.11	0.00**
Upper secondary general	0.18	0.18	-0.00***
Tertiary	0.31	0.45	-0.14***
Full-time student	0.14	0.16	-0.02***
Family outcomes			
Married or cohabiting	0.12	0.22	-0.09***
With children	0.05	0.11	-0.06***
Labor market outcomes			
Active	0.80	0.74	0.06***
Unemployed	0.15	0.16	-0.01***
Employed	0.65	0.58	0.07***
Observations	312,465	296,327	
Occupational outcomes			
Elementary	0.30	0.23	0.07***
Semi-skilled blue collar	0.30	0.03	0.27***
Semi-skilled white collar	0.27	0.53	-0.26***
High-skilled	0.11	0.20	-0.09***
Observations	197,259	166,740	

Source: Spanish Labor Force Survey 2000-2016.

Notes: this table reports summary statistics of the main variables of interest for cohorts affected by the reform. The sample comprises women (men) born between 1978 and 1986 and aged 22 to 30 when interviewed in the LFS. Occupational outcomes are computed on the sample of employed respondents.

*** p<0.01, ** p<0.05, * p<0.1.

Table 3: **Impact of the reform on labor market outcomes**

	(1) Employed	(2) Unemployed	(3) Inactive
Panel A: women			
Share of students in the new system	-0.0738***	0.0298	0.0440**
	(0.0236)	(0.0183)	(0.0196)
Observations	296327	296327	296327
Pre-reform mean	0.51	0.19	0.30
Panel B: men			
Share of students in the new system	0.0237	-0.0152	-0.00854
	(0.0198)	(0.0121)	(0.0185)
Observations	312465	312465	312465
Pre-reform mean	0.67	0.13	0.20

Source: Spanish Ministry of Education and Spanish Labor Force Survey 2000-2016.

Notes: this table reports the impact of the Spanish comprehensive school reform on men's and women's labor market outcomes. Each column refers to a different outcome. These results are obtained from the estimation of regression 1 on the sample of women (men) born between 1978 and 1986, interviewed between 2000 and 2016, and aged 22 to 30. Each regression also includes cohort, birth-province, year fixed effects, province-specific cohort size, share of left-wing municipalities, and province gdp during the year of implementation of the reform. The reported coefficients represent the effect of the full implementation of the reform, achieved when the share of students enrolled in the new system goes from 0 to 1. Standard errors clustered at the level of birth province are reported in parenthesis. The pre-reform mean refers to the mean of the outcome variables for the 1973-1977 cohorts, the last five cohorts not affected by the reform, when aged 22 to 30.

*** p<0.01, ** p<0.05, * p<0.1.

Table 4: **Impact of the reform on log monthly wages**

	(1) Women	(2) Men
Share of students in the new system	-0.0461	0.0194
	(0.0427)	(0.0402)
Observations	693799	727665
Sample mean	1397	1726

Notes: this table reports the impact of the Spanish comprehensive school reform on women's and men's log monthly wages. These results are obtained from the estimation of regression 1 on women (men) born between 1978 and 1986, and entering into the data set between 2006 and 2015. All regressions include birth-province, cohort, and year fixed effects, province-specific cohort size, share of left-wing municipalities, and province gdp during the year of implementation of the reform. Standard errors clustered at the level of birth province are reported in parenthesis.

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

Table 5: **Impact of the reform on women's labor market outcomes - different specifications**

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Employed						
Share of students in the new system	-0.0738***	-0.0735***	-0.0650**	-0.0782***	-0.0800***	-0.0634***
	(0.0236)	(0.0237)	(0.0255)	(0.0242)	(0.0236)	(0.0228)
Age						0.385***
						(0.0164)
Age squared						-0.00667***
						(0.000301)
Panel A: Inactive						
Share of students in the new system	0.0440**	0.0462**	0.0239	0.0483**	0.0528**	0.0401**
	(0.0196)	(0.0196)	(0.0230)	(0.0214)	(0.0202)	(0.0199)
Age						-0.399***
						(0.0146)
Age squared						0.00682***
						(0.000266)
Observations	296327	296327	296327	296327	296327	296327
Year FE	YES	YES	YES	YES	YES	NO
Prov-cohort controls	YES	NO	YES	YES	YES	YES
Birth-prov-linear cohort trends	NO	NO	YES	NO	NO	NO
Birth-prov-linear year trends	NO	NO	NO	YES	NO	NO
Prov-res*year FE	NO	NO	NO	NO	YES	NO

Source: Spanish Ministry of Education and Spanish Labor Force Survey 2000-2016.

Notes: this table reports the impact of the Spanish comprehensive school reform on women's labor market outcomes. Panel A refers to the probability of being employed, while panel B concerns that of being out of the labor force. All results are obtained from the estimation of regression 1 on the sample of women born between 1978 and 1986, interviewed between 2000 and 2016, and aged 22 to 30. Besides the main regressor of interest, each regression includes cohort, birth-province and year fixed effects. The first column reports the main specification. The one reported in column 2 excludes province-cohort varying controls. In column 3, province-linear cohort trends are included. The model in column 4 includes province-linear year trends. In column 5, province-of-residence-times-year FE are included. In the last column, age and age squared are also included. Note that in this specification only cohort and birth-province FE are included. The reported coefficients represent the effect of the full implementation of the reform, achieved when the share of students enrolled in the new system goes from 0 to 1. Standard errors clustered at the level of birth province are reported in parenthesis.

*** p<0.01, ** p<0.05, * p<0.1.

Table 6: **Impact of the reform on female employment - further robustness checks**

	(1) Main specification	(2) With c-1 treatment	(3) With c-2 treatment	(4) With both
Panel A: Employed				
Exposure in p,c	-0.0738***	-0.0681**	-0.0677***	-0.0687*
	(0.0236)	(0.0294)	(0.0250)	(0.0392)
Exposure in p,c-1		-0.00927		0.00159
		(0.0244)		(0.0479)
Exposure in p,c-2			-0.00439	-0.00546
			(0.0253)	(0.0461)
Panel A: Inactive				
Exposure in p,c	0.0440**	0.0503*	0.0321	0.0665**
	(0.0196)	(0.0267)	(0.0238)	(0.0317)
Exposure in p,c-1		-0.0174		-0.0564
		(0.0211)		(0.0373)
Exposure in p,c-2			-0.00197	0.0358
			(0.0202)	(0.0367)
Observations	296327	256332	217498	217498

Notes: These results are obtained from the estimation of regression 1 on the sample of women born between 1978 and 1986, interviewed between 2000 and 2016, and aged 22 to 30. Each regression also includes cohort, birth-province, year fixed effects, province-specific cohort size, share of left-wing municipalities, and province gdp during the year of implementation of the reform. The reported coefficients represent the effect of the full implementation of the reform, achieved when the share of students enrolled in the new system goes from 0 to 1. Standard errors clustered at the level of birth province are reported in parenthesis.

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

Table 7: **Impact of the reform on women's labor market outcomes - cohorts 1978-1983**

	(1) Employed	(2) Unemployed	(3) Inactive
Share of students in the new system	-0.0437** (0.0217)	0.00489 (0.0123)	0.0388*** (0.0138)
Observations	271980	271980	271980
Pre-reform mean	0.51	0.19	0.30

Source: Spanish Ministry of Education and Spanish Labor Force Survey 2000-2016.

Notes: this table reports the impact of the Spanish comprehensive school reform on women's labor market outcomes. Each column refers to a different outcome. These results are obtained from the estimation of regression 1 on the sample of women born between 1978 and 1983, interviewed between 2000 and 2016, and aged 22 to 33. Each regression also includes cohort, birth-province, year fixed effects, province-specific cohort size, share of left-wing municipalities, and province gdp during the year of implementation of the reform. The reported coefficients represent the effect of the full implementation of the reform, achieved when the share of students enrolled in the new system goes from 0 to 1. Standard errors clustered at the level of birth province are reported in parenthesis. The pre-reform mean refers to the mean of the outcome variables for the 1973-1977 cohorts, the last five cohorts not affected by the reform, when aged 22 to 30.

*** p<0.01, ** p<0.05, * p<0.1.

Table 8:   **Women's observable characteristics by level of education - age 22-30**

	(1) Compulsory education	(2) High school or more	(3) Difference
Socio-economic background			
Highly-educated mother	0.01	0.17	-0.16***
Employed mother	0.36	0.43	-0.08***
Unemployed mother	0.14	0.06	0.08***
Mother in elementary job	0.15	0.09	0.06***
Mother in semi-skilled blue-collar job	0.02	0.02	0.00
Mother in semi-skilled blue-collar job	0.15	0.21	-0.06***
Mother in high-skilled job	0.03	0.11	-0.08***
Highly-educated father	0.05	0.22	-0.18***
Employed father	0.63	0.71	-0.08***
Unemployed father	0.11	0.04	0.07***
Father in elementary job	0.21	0.14	0.06***
Father in semi-skilled blue-collar job	0.26	0.21	0.06***
Father in semi-skilled blue-collar job	0.12	0.18	-0.07***
Father in high-skilled job	0.05	0.17	-0.12***
Observations	60,130	182,393	
Family outcomes			
Married or cohabiting	0.35	0.17	0.18***
With children	0.26	0.06	0.20***
Observations	74,749	221,578	
Partner's characteristics			
Highly-educated	0.08	0.37	-0.29***
Employed	0.78	0.88	-0.10***
Employed in a high-skilled job	0.04	0.16	-0.12***
Observations	26,099	30,050	

Source: Spanish Labor Force Survey 2000-2016.

Notes: this table reports statistics concerning the socio-economic background and family outcomes of low-educated women and of those with at least a high-school degree. The sample comprises women born between 1978 and 1986 and aged 22 to 30 when interviewed in the LFS. Figures regarding the socio-economic background are computed on the sample of women living with their parents. Those on partner's characteristics concern the sample of married or cohabiting women. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 9: **Impact of the reform on individuals with a high-school or post-secondary vocational degree**

	Extensive margin			Intensive margin		
	(1) Employed	(2) Unemployed	(3) Inactive	(4) Low-skilled jobs	(5) Semi-skilled jobs	(6) High-skilled jobs
Panel A: women						
Share of students the new system	-0.0795** (0.0388)	0.0439 (0.0334)	0.0356 (0.0257)	0.0112 (0.0370)	-0.0722 (0.0477)	0.00801 (0.0140)
Observations	67490	67490	67490	46181	46181	46181
Panel B: men						
Share of students in the new system	-0.0172 (0.0322)	-0.0105 (0.0140)	0.0277 (0.0230)	-0.0164 (0.0302)	0.0232 (0.0413)	0.000255 (0.0112)
Observations	73154	73154	73154	54375	54375	54375

Source: Spanish Ministry of Education and Spanish Labor Force Survey 2000-2016.

Notes: this table reports the impact of the Spanish comprehensive school reform on employment and occupational outcomes of individuals belonging to the affected cohorts, whose highest level of education is either a high-school or post-secondary vocational degree. Panel A focuses on women, while panel B refers to men. In each panel, the first three columns present the effect at the extensive margin, while the last three columns focus on the impact at the intensive margin. The occupations considered are those jobs that employ most of the 1973-1977 female (male) workers with an advanced vocational degree. All the results are obtained from the estimation of regression 1 on the sample of women (men) with either a high-school or post-secondary vocational degree, born between 1978 and 1986, interviewed between 2000 and 2016, and aged 22 to 30. In the last three columns, the sample is restricted to employed individuals. Each regression also includes cohort, birth-province and year fixed effects. The reported coefficients represent the effect of the full implementation of the reform, achieved when the share of students enrolled in the new system goes from 0 to 1. Standard errors clustered at the level of birth province are reported in parenthesis. The pre-reform mean refers to the mean of the outcome variables for women (men) with an advanced vocational degree, belonging to the 1973-1977 cohorts, the last five cohorts not affected by the reform, when aged 22-30.

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

11 Appendix

11.1 Impact on graduates from advanced general programs

In principle, the de-tracking reform can have an impact also on those individuals who, even under the old system, would have attended the academic track since age 14. In comparison to students who pursue their academic studies in the old educational system, those studying under the reformed system experience a wider ability distribution in the classroom, while in lower secondary education. On the one hand, this may worsen teaching quality, with negative consequences on their school performance and labor market outcomes (Duflo et al. 2011, Lavy et al. 2012a, Lavy et al. 2012b). On the other hand, it can push them to distinguish themselves from their lower-achieving classmates and increase their likelihood of choosing more challenging tracks in upper secondary education, with positive knock-on effects on occupational choices. We explore these hypothesis in tables A.6 and A.7, by estimating 1 on the sample of affected cohorts whose highest level of education is either an upper secondary general degree, or a tertiary degree. The estimates in panel A refer to men, while those in panel B concern women. In both cases, we consider respondents who are between 22 and 30, over the years 2000-2016. As above, the first three columns refer to the extensive margin, while the last three focus on the intensive margin. The occupational outcomes refer to the low-skilled, semi-skilled and high-skilled professions where 1973-1977 respondents with either upper secondary general or tertiary education are employed. None of the estimates shows up significant in this table, suggesting that the reform has neither a strong detrimental nor positive effect on employment and occupational outcomes of high-achieving individuals in the affected cohorts.

11.2 Further graphs and tables

Figure A.1: **Renovation plans of school buildings to implement the de-tracking reform**
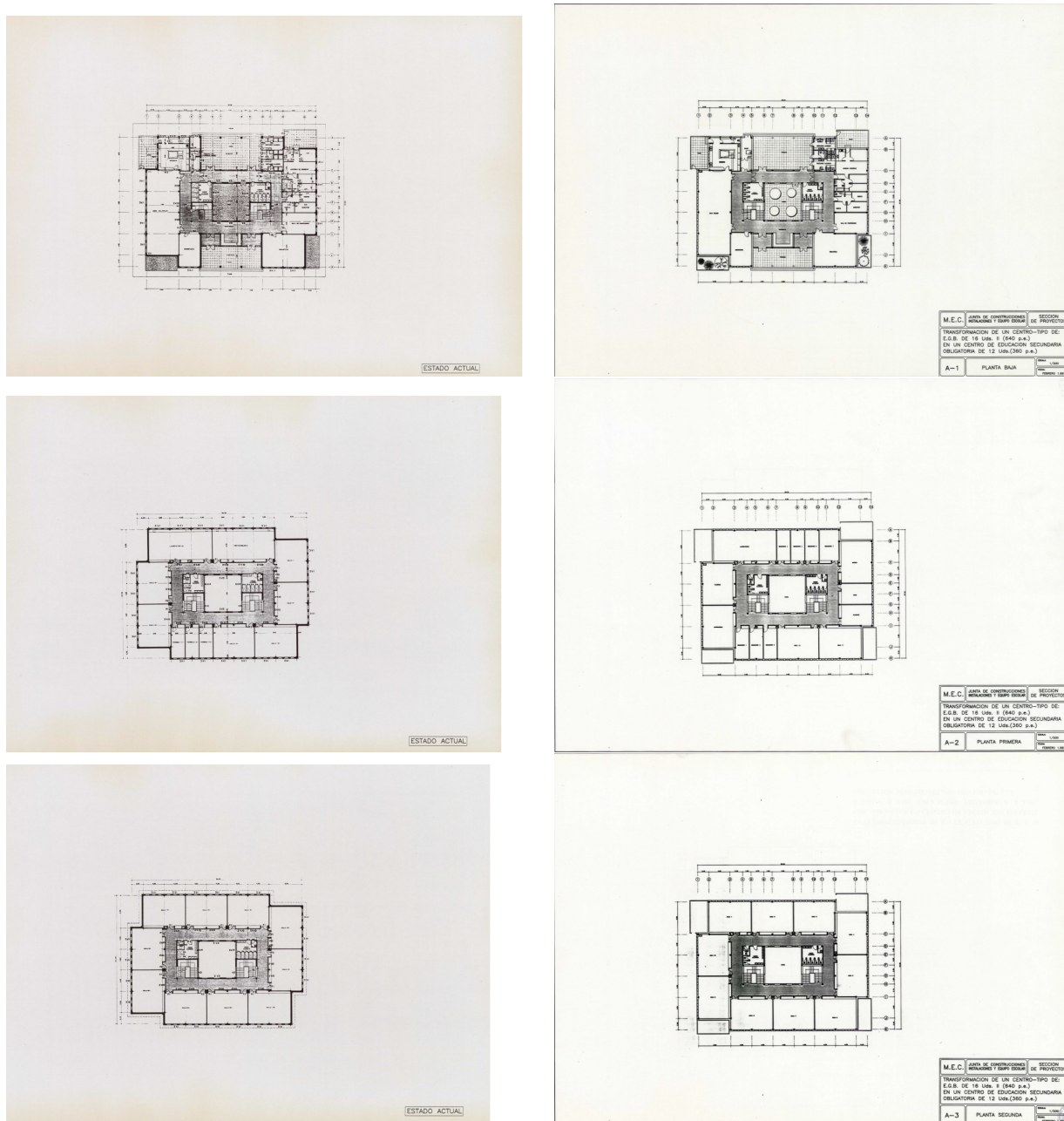
Source: Spanish Ministry of Education.
Notes: This figure shows the restructuring plans of schools buildings contained in a 1992 publication of the Spanish Ministry of Education. In detail, the graphs on the left show the configuration of each floor of a school building in 1992, while the ones on the right represent the planned changes needed to implemented the de-tracking reform.
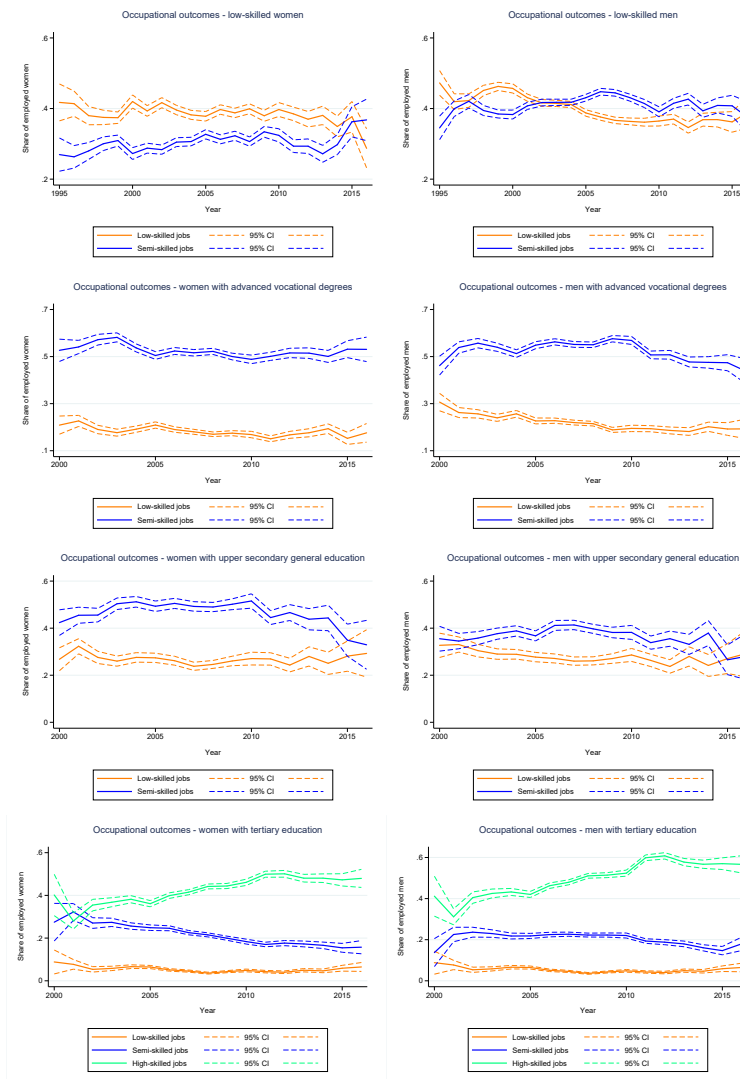
Figure A.2: **Evolution of educational and labor market outcomes**
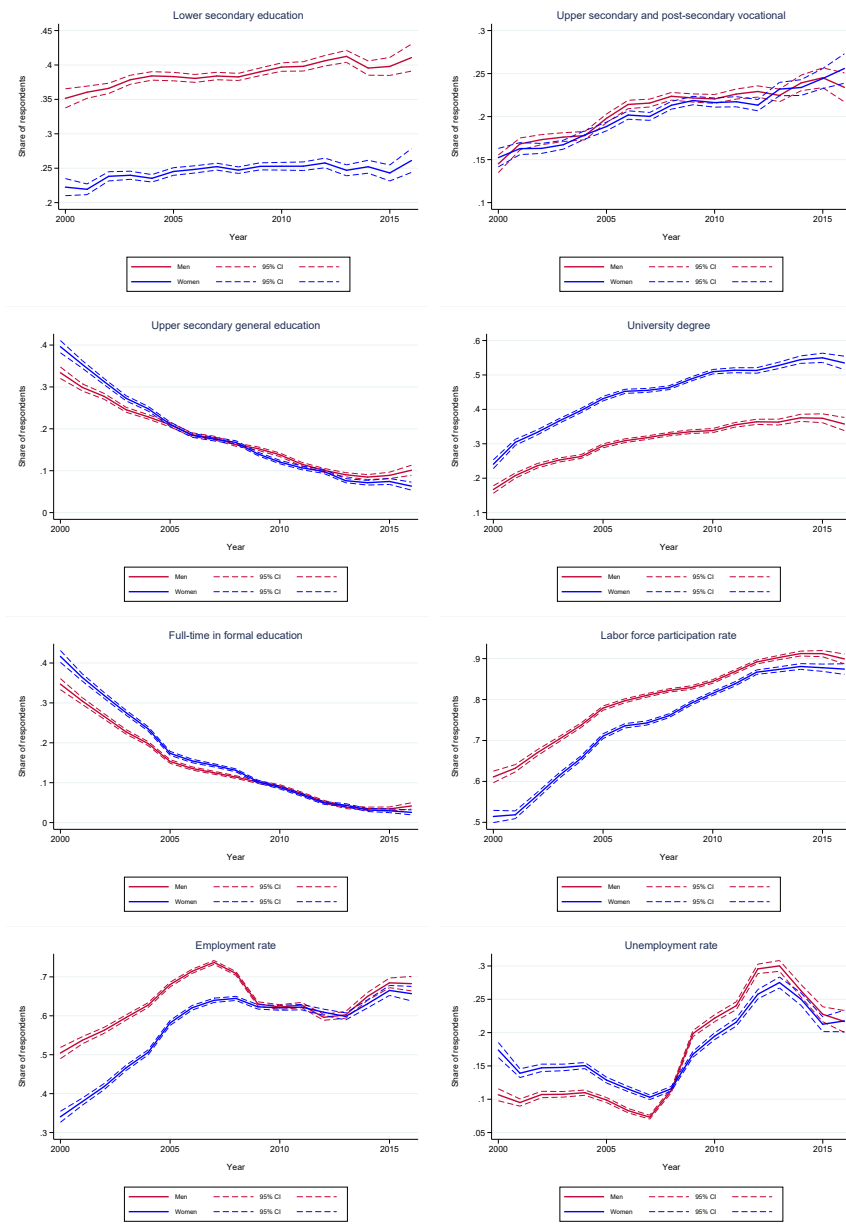
Source: Spanish Labor Force Survey 2000-2016.
Notes: This figure shows the evolution of the outcomes of interest over the estimation period. The estimation sample comprises men (women) born between 1978 and 1986 and aged 22-30 when interviewed.

Figure A.3: **Evolution of occupational outcomes**

Source: Spanish Labor Force Survey 2000-2016.
Notes: This figure shows the evolution of occupational outcomes over the estimation period. The estimation sample comprises men (women) born between 1978 and 1986 and aged 22-30 when interviewed. The graphs concerning low-skilled men (women) are constructed over the period 1995-2016 and refer to individuals aged 17-30.

Table A.1: **Impact of the reform on educational attainment**

	(1) Less than high school	(2) Secondary or post-secondary vocational degree	(3) Secondary or university general degree	(4) Currently studying
Panel A: women				
Share of students in the new system	0.0135	-0.0230	0.00585	0.0195
	(0.0197)	(0.0212)	(0.0332)	(0.0195)
Observations	296327	296327	296327	296327
Pre-reform mean	0.32	0.15	0.25	0.18
Panel B: men				
Share of students in the new system	0.0401*	-0.0231	-0.0227	0.00211
	(0.0217)	(0.0210)	(0.0284)	(0.0162)
Observations	312465	312465	312465	312465
Pre-reform mean	0.43	0.15	0.19	0.15

Source: Spanish Ministry of Education and Spanish Labor Force Survey 2000-2016.

Notes: this table reports the impact of the Spanish comprehensive school reform on women's and men's educational outcomes. Each column refers to a different outcome. These results are obtained from the estimation of regression 1 on the sample of women (men) born between 1978 and 1986, interviewed between 2000 and 2016, and aged 22 to 30. Each regression also includes cohort, birth-province, year fixed effects, province-specific cohort size, share of left-wing municipalities, and province gdp during the year of implementation of the reform. The reported coefficients represent the effect of the full implementation of the reform, achieved when the share of students enrolled in the new system goes from 0 to 1. Standard errors clustered at the level of birth province are reported in parenthesis. The pre-reform mean refers to the mean of the outcome variables for the 1973-1977 cohorts, the last five cohorts not affected by the reform, when aged 22 to 30.

*** p<0.01, ** p<0.05, * p<0.1.

Table A.2: **Impact of the reform on women's labor market outcomes by level of education**

	(1) Employed	(2) Unemployed	(3) Inactive
Women with less than high school	-0.172***	0.0914**	0.0801**
	(0.0506)	(0.0343)	(0.0351)
Pre-reform mean	0.46	0.32	0.23
Women with high-school or more	-0.0494*	0.0136	0.0358
	(0.0273)	(0.0226)	(0.0229)
Pre-reform mean	0.51	0.17	0.32
Observations	296327	296327	296327
P-value difference	0.0480		
P-value difference		0.0760	
P-value difference			0.324

Source: Spanish Ministry of Education and Spanish Labor Force Survey 2000-2016.

Notes: this table reports the heterogeneous impact of the Spanish comprehensive school reform on women's labor market outcomes by level of education. Each column refers to a different outcome. These results are obtained from the estimation of regression 1, where all regressors are included by themselves, and interacted with a dummy equal to one if the highest level of education is lower secondary education. The estimation sample comprises women born between 1978 and 1986, interviewed between 2000 and 2016, and aged 22 to 30. The reported coefficients represent the effect of the full implementation of the reform, achieved when the share of students enrolled in the new system goes from 0 to 1. Standard errors clustered at the level of birth province are reported in parenthesis. Finally, the pre-reform mean refers to the mean of the outcome variables for the 1973-1977 cohorts, the last five cohorts not affected by the reform, when aged 22-30.

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

Table A.3: **Additional robustness check - role of the financial crisis**

	Probability of being employed			
	(1) Main specification	(2) No age restrictions	(3) Before the financial crisis	(4) After the financial crisis
Share of students in the new system	-0.0735***	-0.0837***	-0.0785***	-0.0645**
	(0.0237)	(0.0154)	(0.0223)	(0.0282)
Observations	296327	555670	321802	233868

Source: Spanish Ministry of Education and Spanish Labor Force Survey 2000-2016.

Notes: this table reports the impact of the Spanish comprehensive school reform on women's probability of being employed. These results are obtained from the estimation of regression 1 on the sample of women (men) born between 1978 and 1986. Each regression also includes cohort, birth-province and year fixed effects. The first column reports the main specification, estimated on women aged 22 to 30, over the years 2000 and 2016. The second one removes any age restriction. The third one is estimated over the period 2000-2008, while the last one concerns the years 2009 to 2016. The reported coefficients represent the effect of the full implementation of the reform, achieved when the share of students enrolled in the new system goes from 0 to 1. Standard errors clustered at the level of birth province are reported in parenthesis.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.4: **Impact of the reform on employment and occupational outcomes of low-educated women**

Panel A: extensive margin

	(1) Employed	(2) Unemployed	(3) Inactive
Share of students in the new system	-0.0890***	0.0195	0.0695***
	(0.0250)	(0.0202)	(0.0243)
Observations	192769	192769	192769

Panel B: intensive margin

	(1) Low-skilled jobs	(2) Semi-skilled jobs	(3) High-skilled jobs
Share of students in the new system	0.0750	-0.0634	-0.00181
	(0.0610)	(0.0463)	(0.00144)
Observations	63748	63748	63748

Source: Spanish Ministry of Education and Spanish Labor Force Survey 1995-2016.

Notes: this table reports the impact of the Spanish comprehensive school reform on employment and occupational outcomes of women with less than a high-school degree, when aged 17 to 30. Panel A focuses on the effect at the extensive margin, while panel B presents the impact at the intensive margin. The low-skilled and semi-skilled occupations considered are those jobs that employ most of the 1973-1977 female workers with a lower secondary vocational degree. For completeness, the impact on female-dominated high-skilled profession is also considered. All the results are obtained from the estimation of regression 1 on the sample of women with lower secondary education, born between 1978 and 1986, interviewed between 1996 and 2016, and aged 17 to 30. In panel B, the sample is restricted to low-skilled employed women. Each regression also includes cohort, birth-province and year fixed effects. The reported coefficients represent the effect of the full implementation of the reform, achieved when the share of students enrolled in the new system goes from 0 to 1. Standard errors clustered at the level of birth province are reported in parenthesis. The pre-reform mean refers to the mean of the outcome variables for low-educated women belonging 1973-1977 cohorts, the last five cohorts not affected by the reform, when aged 17-30.

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

Table A.5: **Impact of the reform on employment and occupational outcomes of low-educated men**

Panel A: extensive margin

	(1) Employed	(2) Unemployed	(3) Inactive
Share of students in the new system	-0.0204 (0.0220)	-0.0128 (0.0130)	0.0333* (0.0192)
Observations	269728	269728	269728

Panel B: intensive margin

	(1) Low-skilled occupations	(2) Semi-skilled occupations	(3) High-skilled occupations
Share of students in the new system	0.0267 (0.0339)	-0.0317 (0.0312)	-0.00149 (0.00208)
Observations	134382	134382	134382

Source: Spanish Ministry of Education and Spanish Labor Force Survey 1995-2016.

Notes: this table reports the impact of the Spanish comprehensive school reform on employment and occupational outcomes of men with less than a high-school degree, when aged 17 to 30. Panel A focuses on the effect at the extensive margin, while panel B presents the impact at the intensive margin. The low-skilled and semi-skilled occupations considered are those jobs that employ most of the 1973-1977 male workers with a lower secondary vocational degree. For completeness, the impact on any type of high-skilled profession is also considered. All the results are obtained from the estimation of regression 1 on the sample of men with lower secondary education, born between 1978 and 1986, interviewed between 1996 and 2016, and aged 17 to 30. In panel B, the sample is restricted to low-skilled employed men. Each regression also includes cohort, birth-province and year fixed effects. The reported coefficients represent the effect of the full implementation of the reform, achieved when the share of students enrolled in the new system goes from 0 to 1. Standard errors clustered at the level of birth province are reported in parenthesis. The pre-reform mean refers to the mean of the outcome variables for low-educated men belonging to the 1973-1977 cohorts, the last five cohorts not affected by the reform, when aged 17-30.

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

Table A.6: **Impact of the reform on individuals with upper secondary general education**

	Extensive margin			Intensive margin		
	(1) Employed	(2) Unemployed	(3) Inactive	(4) Low-skilled jobs	(5) Semi-skilled jobs	(6) High-skilled jobs
Panel A: Women						
Share of students in the new system	-0.0645 (0.0447)	0.00227 (0.0258)	0.0622 (0.0410)	0.0380 (0.0648)	0.0456 (0.0778)	0.0101 (0.0161)
Observations	54010	54010	54010	20610	20610	20610
Panel B: Men						
Share of students in the new system	-0.00830 (0.0458)	-0.00137 (0.0246)	0.00967 (0.0443)	-0.0106 (0.0793)	-0.0468 (0.0912)	-0.0166 (0.0170)
Observations	55626	55626	55626	23190	23190	23190

Source: Spanish Ministry of Education and Spanish Labor Force Survey 2000-2016.

Notes: this table reports the impact of the 1990 reform on employment and occupational outcomes of individuals belonging to the affected cohorts, whose highest level of education is upper secondary general education. Panel A focuses on women, while panel B on men. In each panel, the first three columns present the effect at the extensive margin, while the last three columns focus on the impact at the intensive margin. The occupations considered are those jobs that employ most of the 1973-1977 female (male) workers with an advanced academic degree. All the results are obtained from the estimation of regression 1 on the sample of women (men) with either an upper secondary or tertiary academic degree, born between 1978 and 1986, interviewed between 2000 and 2016, and aged 22 to 30. In the last three columns, the sample is restricted to employed individuals. Each regression also includes cohort, birth-province and year fixed effects. The reported coefficients represent the effect of the full implementation of the reform, meaning when the share of students enrolled in the new system goes from 0 to 1. Standard errors clustered at the level of birth province are reported in parenthesis.

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

Table A.7: **Impact of the reform on individuals with tertiary education**

	Extensive margin			Intensive margin		
	(1) Employed	(2) Unemployed	(3) Inactive	(4) Low-skilled jobs	(5) Semi-skilled jobs	(6) High-skilled jobs
Panel A: Women						
Share of students in the new system	-0.0122	0.00580	0.00637	-0.0141	-0.0453	0.0781
	(0.0281)	(0.0259)	(0.0289)	(0.0148)	(0.0380)	(0.0522)
Observations	96794	96794	96794	57334	57334	57334
Panel B: Men						
Share of students in the new system	0.0344	-0.0186	-0.0158	-0.00986	0.000747	0.0519
	(0.0412)	(0.0242)	(0.0365)	(0.0124)	(0.0437)	(0.0583)
Observations	56913	56913	56913	32502	32502	32502

Source: Spanish Ministry of Education and Spanish Labor Force Survey 2000-2016.

Notes: this table reports the impact of the 1990 reform on employment and occupational outcomes of individuals belonging to the affected cohorts, whose highest level of education is tertiary education. Panel A focuses on women, while panel B on men. In each panel, the first three columns present the effect at the extensive margin, while the last three columns focus on the impact at the intensive margin. The occupations considered are those jobs that employ most of the 1973-1977 female (male) workers with an advanced academic degree. All the results are obtained from the estimation of regression 1 on the sample of women (men) with either an upper secondary or tertiary academic degree, born between 1978 and 1986, interviewed between 2000 and 2016, and aged 22 to 30. In the last three columns, the sample is restricted to employed individuals. Each regression also includes cohort, birth-province and year fixed effects. The reported coefficients represent the effect of the full implementation of the reform, meaning when the share of students enrolled in the new system goes from 0 to 1. Standard errors clustered at the level of birth province are reported in parenthesis.

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