

Estimating taxpayer subsidies and individual repayment burdens of a student loan program in Spain

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Abstract

We study the program *Préstamos Renta Universidad* that provided loans to Master's students in Spain to cover fees and living expenses between 2007 and 2010. We estimate predicted income functions and calculate individual repayment burdens and government cost using unconditional quantile regression analysis. Our results suggest that, when loans had to be repaid in full, imposed repayment burdens were excessive for most applicants, but were generally too low at the 90th percentile of the income distribution. Taxpayer subsidies (or the cost to the Government), were well below 50% of provided funds and decreasing with the subsequent calls. These results do not apply to the 2007-2008 call, which allowed the possibility of partial repayment. We argue that new proposals for student loans in Spain should involve targeted deferment and interest subsidies instead of general grace periods and 0% interest rates, as well as longer repayment periods that allow a sufficient investment recovery rate for the government.

Keywords: educational finance, student loans, repayment burdens
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1. Introduction

Public support for higher education is generally justified by the existence of borrowing constraints and the will to promote access from the less well-off students. However, the typically large private returns of investments in higher education also justify larger cost sharing by the student, particularly at times of financial restraint and to the benefit of other social programs such as basic education, pensions or health. A well-designed student loan program can improve efficiency as well as equity (Salmi, 2003). By allowing students to enrol at no ex-ante financial cost, barriers to entry can be eliminated. But borrowing to finance higher education is risky (see Avery and Turner (2012) or Martins and Pereira (2004)), and some graduates are never able to repay their loan in full. Adding an element of insurance in the repayment reinforces the access of the more risk averse (probably the less well-off), and protects low earners. Efficient consumption smoothing also requires insurance.

Income contingent loans incorporate insurance by making repayment of the loan depend on current earnings (to protect individuals when monthly earnings are low) as well as lifetime earnings (to protect those who are always low earners, by forgiving any outstanding debt after x years).¹ This is in contrast with typical mortgage loans, where repayments are made on the basis of predetermined amounts over a given time period. Although student loans have been used in different countries since the 1950s, income contingent loans were first introduced in Australia in 1989. The number of countries introducing income contingent loan programs to finance higher education has been increasing ever since and today includes among others New Zealand, the United Kingdom, Hungary, South Korea, and the Netherlands (Chapman, 2014).

In Spain, the program *Préstamos Renta Universidad* (PRU) provided Master's students with loans in order to increase the educational level of the population and improve educational opportunity. To this aim, each loan provided an amount sufficient to pay the fees required to attend a Master's degree and also cover living expenses. The program was in place for 4 years, from 2007 to 2010, but conditions were amended each year. The first call included some elements of income contingency in the form of

¹ We thank Nicholas Barr for pointing to this double sense in which repayments typically depend on income.

an unlimited deferment period for low earners and the extinction of the debt 15 years after its formalization. However, for those liable to pay, due amounts were predetermined as in typical mortgage loans. The second call increased the maximum amount of the loan, the maturity of the contract and the grace period, but distributed the predetermined repayment in a way such that the loan was to be totally repaid by all in 20 years. The third and last call toughened the conditions even harder. The evolution of conditions allows evaluating the different calls. In the last year in place, 2010, the conditions became particularly harsh and, due also to economic turndown, they led to protest.

The aim of this paper is to evaluate this program in terms of the severity of the repayment conditions and the size of the implicit taxpayer subsidy. In order to do that, we use data from the Survey of Household Finances (Bank of Spain) 2008 to construct income predictions for individuals holding a Master's degree that year, and we do unconditional quantile regression analysis to estimate incomes at different percentiles of the income distribution (Q10, Q25, Q50, Q75 and Q90). Using our estimates of income and each year's repayment conditions, we calculate the ratio of loan repayment to gross income in a given period, or repayment burden. This is the way the severity of repayment conditions is usually measured. In the USA, analyses of student debt have included guidelines ranging from 5 to 15 percent of gross income as acceptable burdens, but *the 8 percent rule* has come to be accepted as the consensus standard (Baum and Schwartz, 2006). However, it has also been recognised that, the higher the earnings are, the higher the proportion that can be devoted to student loan repayment is (Dynarsky and Kreisman, 2013) and this must also be kept in mind. Del Rey and Racionero (2010) show that in order for the loan system to induce efficient participation, successful graduates must pay more than they owe.

Our calculations of repayment burdens for individuals in different percentiles of the income distribution are under the assumption that they borrowed the maximum amount allowed by each call. This is clearly an extreme assumption, and generates the highest possible individual debt. Results can however be easily adapted to allow for lower levels of debt by proportionally reducing the resulting burden. We also look at the government cost of the program, or the tax subsidy. Following income and repayment predictions, we are able to estimate how much money the government recovers. Each

call presented different conditions related to interest rates, maturities and deferment periods that clearly affect the ability of the government to recover its investment. The taxpayer naturally contributes whatever is not repaid. We also need to take into account the difference between the nominal interest rate charged to the borrower (in three out of the four calls, a zero nominal rate) and the cost of funds to the government (the nominal interest rate).

The rest of the paper is organized as follows. Section 2 describes the data and the model used to estimate predicted income. Section 3 describes the program and subsequent reforms and presents the estimated repayment burdens for men and women at different percentiles and the cost for the government. Section 4 concludes.

2. Data and estimated model

We use the Survey of Household Finances (SHF), conducted every three years by the Bank of Spain. The first survey was conducted in 2002, followed by a second and a third wave in 2005 and 2008. We use the 2008 data since it comes closer to the first call of the PRU programme and it better represents expected earnings of applicants. The survey collects data on wealth, income, debt, consumption and demographic characteristics from a representative sample of Spanish households. Important features of the SHF are the oversampling of wealthy households and the imputation of “No Answer” or “Don’t Know” replies for all the variables in the survey.² Barceló (2006) offers a detailed description of imputation in the SHF, whereas more information about the SHF2008 can be found in Bover (2011).³

The total number of households interviewed is 6,197. The survey allows having information on the level of education attained and labour market experience of each member of the household. Therefore, we consider that SHF is an adequate database for the purpose of the paper, since it allows identifying Master’s graduates. There are 1422 people who hold a master’s degree in SHF2008, of whom 40.78% are women.

² Since the distribution of wealth in the population is heavily skewed, and some types of assets are held by only a small fraction of the population, a standard random sample would not contain enough observations for the analysis of wealth. Also, due to the sensitivity of the issue of household finances, item non-response is an inherent characteristic of wealth surveys.

³ Although the oversampling of wealthy households can be corrected, this is not recommended when using a non-representative subsample as we do.

Following Chapman and Lounkaew (2010) and Chapman and Sinning (2012), we have excluded people who are either self-employed, in education or recorded as having zero income even though they are employed.⁴ After exclusion, we have a sample of 693 master degree holders. The percentage of women is now higher: 47.33%.

In order to calculate the repayment flow implied by PRU, we estimate the age-income profile of workers holding a Master's degree by employing a standard income regression model as in Chapman and Sinning (2012). To compute the annual income, we use the self-reported monthly gross income. Annual income is 12 times the monthly gross income. Labour market experience is defined as the number of years in labour market after master degree. Since individuals typically graduate at 22, we assume that graduates holding a master degree are at least 23. Therefore, labour market experience equals age minus 23.

Table 1 shows some descriptive statistics. Significant differences in gross income between females and males can be observed, a feature that is coherent with previous papers showing gender wage gaps in Spain (Amuedo-Dorantes and de la Rica (2006) and Budría and Moro-Egido (2008) among others). Hence, it seems convenient to include a dummy variable to control for gender differences. Women present less experience as well. In this case, differences between females and males are much subtler, however.

It is also worth noting that holding a Master's degree raises annual earnings by 5.000 Euros per year on average with respect to only holding a graduate degree. However, the differences across percentiles and between men and women are remarkable (see Panel B on Table 1).

The equation we estimate is the following:

$$y = \alpha + \beta_1 D + \beta_2 \text{exp} + \beta_3 \text{exp}^2 + \varepsilon$$

⁴ Since unemployed people are not included in the sample, our results represent a lower bound both on payment burdens and government cost.

where y is annual gross income, D is the gender dummy variable and exp stands for labour market experience in years. To estimate the earnings equation we use unconditional quantile regression. As pointed out in Chapman and Lounkaew (2014) this technique offers two improvements over ordinary least squares that are desirable in this context. First, it gives robust results when the dependent variable distribution is not symmetric, as it is the case with earnings. Second, it provides a disaggregation of income distributions. Student payment burdens would be different along the income distribution and this cannot be captured by traditional ordinary least squares estimation. We use the re-centered influence function methodology by Firpo et.al. (2009) to estimate the unconditional quantile regressions. We follow Chapman and Sinning (2012), but include the 10th and 90th percentiles in addition to the 25th, 50th, 75th percentiles.

Table 1 Descriptive statistics

Panel A. Gross income and experience of master holders

| Master holders | Men | | Women | |
|----------------|----------|-----------|----------|-----------|
| Variable | Mean | Std. Dev. | Mean | Std. Dev. |
| Gross Income | 34141.54 | 1648.06 | 25399.41 | 1486.84 |
| Experience | 17.89 | 1.08 | 15.39 | 0.95 |
| | | | | |

Panel B. Gross income of master holders and graduates

| Master holders | | 1st quartile | 2nd quartile | 3rd quartile | 4th quartile |
|----------------|-----------|--------------|--------------|--------------|--------------|
| Men | Mean | 18774.52 | 31307.31 | 42506.22 | 73601.59 |
| | Std. Dev. | 977.02 | 529.67 | 702.38 | 4300.13 |
| Women | Mean | 12182.24 | 22579.02 | 31187.41 | 47458.28 |
| | Std. Dev. | 893.82 | 507.00 | 631.05 | 3235.12 |

| Graduates | | 1st quartile | 2nd quartile | 3rd quartile | 4th quartile |
|-----------|-----------|--------------|--------------|--------------|--------------|
| Men | Mean | 13651.54 | 22698.78 | 32566.05 | 68185.96 |
| | Std. Dev. | 517.58 | 623.94 | 800.24 | 10740.27 |
| Women | Mean | 11290.19 | 19816.18 | 27278.50 | 38018.82 |
| | Std. Dev. | 437.59 | 267.06 | 365.79 | 947.56 |

For each edition of the program, we calculate the amount to be paid each year and the corresponding repayment burden.⁵

⁵ Age-income profiles have not been adjusted to capture productivity growth. Salaries in Spain have been stable in the period 2007-2014 and they are not expected to grow in the near future.

Women display on average lower earnings than men, and the gap is increasing along the income distribution, from less than 5.000 Euros a year when comparing men and women in the 10th percentile, to more than 28.000 Euros less per year when we compare men and women in the 90th percentile (table 2). This result adds to previous Spanish evidence. Not only higher education is associated with higher wage dispersion (Budría and Moro-Egido, 2008) but also wage dispersion increases with wealth.

Table 2: Unconditional quantile regression of Annual Earnings

| | Q10 | Q25 | Q50 | Q75 | Q90 |
|------------------------------|-------------|-------------|-------------|--------------|--------------|
| Gender | -4348.04*** | -5048.94*** | -6252.90*** | -10298.39*** | -28511.19*** |
| | (1142.23) | (1328.50) | (1574.68) | (2132.06) | (1242.79) |
| Experience | 1046.60*** | 1469.67*** | 1159.73*** | 1535.70*** | 1429.27** |
| | (224.91) | (190.77) | (217.88) | (277.29) | (647.17) |
| Experience ² /100 | -1858.13*** | -2032.41*** | -1109.54** | -1803.71** | -389.04 |
| | (449.51) | (393.66) | (499.72) | (702.38) | (1693.92) |
| Constant | 10420.45*** | 9152.78*** | 22801.23*** | 36941.02*** | 78029.75*** |
| | (2772.51) | (3005.89) | (3268.27) | (3788.88) | (7024.39) |

*, **, *** statistically significant at 10, 5 and 1 respectively

We assume that all individuals holding a Master's borrowed the maximum amount allowed in each call and estimate the ratio of statutory payments relative to predicted annual earnings, or repayment burden, at each point in time. To calculate the cost to the government, or taxpayer subsidy, we take borrowing cost equal to the interest rate on 10-year government bonds the day the call is passed and funds are made available. With this cost we estimate the actual value of funds recovered by the government. This allows calculating the proportion of loan's principal not redeemed by students.

3. The program *Préstamos Renta Universidad (PRU)*.

The program was initiated in June 2007.⁶ It was presented as an innovative initiative that aimed at allowing all university graduates that might have the opportunity to proceed with graduate studies to do so irrespective of their socio-economic background. The objective was to increase the educational level of the population and improve

⁶ The description of the conditions in the successive calls, summarized here, can be found in the following B.O.E (Official Diary): June 13 2007, October 15 2008, November 19 2009, December 18 2010 and December 27 2013.

educational opportunity. Each loan would then provide an amount sufficient to fund a Master's degree, including living expenses, and would be offered at a 0% nominal interest rate (B.O.E, June 13 2007). The program was in place for 4 years, but conditions were amended each year and repayment burdens changed considerably as a consequence. The rest of this section considers the repayment conditions established in each call and, using our income estimates, reports the burdens imposed on graduates by sex and income percentile.

3.1 First Call

In 2007, the maximum amount of each loan was set at 6.000 Euros plus a monthly payment of 800 Euros along the duration of the master program, with a limit of 21 months. The maximum amount that could be obtained was then 22.800 Euros. Upon graduation, and after the two-year grace period, the borrower could enjoy an unlimited deferment period if her annual taxable income never increased over 22.000 euros.⁷ Each period after the debtor obtained more than 22.000 euros of annual taxable income she had to repay 1/8th of the total debt (divided in 4 trimestral payments) but the debt was in any case extinguished 15 years after its formalization. The loan bore a 0% nominal interest rate.

Table 3 displays the repayment burdens of men and women in different percentiles according to the repayment conditions stated in the first call. Recall that during the duration of the Master's program and two additional years, no payments were due. From then on, only individuals with more than 22.000 Euros of annual taxable income were liable to make repayments. At least 40% of women never pay at all, so the loan program is indeed a subsidy for them. Only 46% of females and 55% of males repay the loan in full. For those who are liable to pay, the repayment burdens are not excessive as compared to the 8% rule, but note how the burden to individuals on the 90th percentile is really too low. There is clearly margin to reducing the burden on lower percentiles and increasing it at the top. Also, of the cases studied, only women at the 75th percentile pay the loan in full, while men on the 50th percentile pay the full amount

⁷ For annual taxable income we take annual gross income net of social security expenses and employment income tax deductions.

by the thirteenth year.

Table 3: Loan repayment burden as a percentage of earnings per quantile, 2007-2008 call.

| | Q10 | | Q25 | | Q50 | | Q75 | | Q90 | |
|----|-------|-------|-------|-------|--------|-------|--------|--------|--------|--------|
| | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| 1 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 2 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 3 | Def | Def | Def | Def | Def | Def | 7.14 | 9.61 | 3.52 | 5.44 |
| 4 | Def | Def | Def | Def | Def | Def | 6.89 | 9.17 | 3.46 | 5.30 |
| 5 | Def | Def | Def | Def | Def | Def | 6.66 | 8.77 | 3.41 | 5.17 |
| 6 | Def | Def | Def | Def | 10.06 | Def | 6.45 | 8.41 | 3.35 | 5.04 |
| 7 | Def | Def | Def | Def | 9.71 | Def | 6.26 | 8.09 | 3.30 | 4.92 |
| 8 | Def | Def | Def | Def | 9.38 | Def | 6.09 | 7.81 | 3.24 | 4.80 |
| 9 | Def | Def | Def | Def | 9.09 | Def | 5.93 | 7.54 | 3.19 | 4.69 |
| 10 | Def | Def | Def | Def | 8.81 | Def | 5.78 | 7.31 | 3.15 | 4.59 |
| 11 | Def | Def | Def | Def | 8.56 | Def | Repaid | Repaid | Repaid | Repaid |
| 12 | Def | Def | Def | Def | 8.33 | 10.19 | Repaid | Repaid | Repaid | Repaid |
| 13 | Def | Def | Def | Def | 8.11 | 9.87 | Repaid | Repaid | Repaid | Repaid |
| 14 | Def | Def | Def | Def | Repaid | 9.58 | Repaid | Repaid | Repaid | Repaid |
| 15 | Def | Def | Def | Def | Repaid | 9.31 | Repaid | Repaid | Repaid | Repaid |

Legend: “Grace” stands for grace period, “Def” stands for deferment due to earnings below threshold, “Repaid” means loan has been totally repaid.

Our estimates of the cost of loans to the government (Table 4) show that, in effect, it reaches 100% at the lower quantiles. The government loan becomes a complete subsidy to students. At the 75th and 90th percentile the subsidy or cost to the government goes down to less than one fourth of the principal. Although both men and women at these percentiles are able to fully repay their loans, the cost of the grace period and the 0% interest rate is born by the government. In other words, if the income distribution or/and the repayment conditions allowed every student to pay back the loan, the program cost for the government would still be 22.64% of provided funds. Note the difference between grace periods, that are universal and imply that not even the highest earners repay the loan in full, and deferments periods, where payments are retarded only if needed. Unlike deferment, grace periods are expensive and unfair.

Table 4: Cost to the government as a percentage of principal per quantile. 2007-2008 call

| Q10 | | Q25 | | Q50 | | Q75 | | Q90 | |
|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|
| Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| 100.00 | 100.00 | 100.00 | 100.00 | 31.94 | 71.42 | 22.64 | 22.64 | 22.64 | 22.64 |

3.2 Second Call

In October 2008, the maximum amount of the loan was increased to 28.800 and the maturity of the loan contract and the grace period were extended to 20 and 5 years respectively. If the individual annual taxable income did not surpass the limit of 22.000 after those 5 years, the debtor could request the postponement of the sixth annuity to the year 20, by adding up to the payment due in that year. If the individual annual taxable income did not surpass the limit of 22.000 on the seventh year, the debtor could apply for the recognition of 5 additional years of deferment period (a total of 10 years including the grace period). In this case, the repayment initially due during the last 5 years was doubled. Loans continued to bear a 0% nominal interest rate, but were now to be totally repaid in 20 years.

Table 5: Loan repayment burden as a percentage of earnings per quantile, 2008-2009 call.

| | Q10 | | Q25 | | Q50 | | Q75 | | Q90 | |
|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| 1 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 2 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 3 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 4 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 5 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 6 | Def | Def | Def | Def | 6.70 | Def | 4.00 | 5.39 | 3.07 | 4.14 |
| 7 | Def | Def | Def | Def | 6.48 | Def | 3.91 | 5.23 | 3.00 | 4.00 |
| 8 | Def | Def | Def | Def | 6.28 | Def | 3.83 | 5.09 | 2.92 | 3.87 |
| 9 | Def | Def | Def | Def | 6.10 | Def | 3.75 | 4.95 | 2.86 | 3.76 |
| 10 | Def | Def | Def | Def | 5.93 | Def | 3.68 | 4.82 | 2.80 | 3.65 |
| 11 | 9.55 | 12.26 | 7.69 | 9.45 | 5.77 | 6.96 | 3.61 | 4.70 | 2.74 | 3.55 |
| 12 | 9.35 | 11.94 | 7.52 | 9.19 | 5.63 | 6.75 | 3.54 | 4.59 | 2.68 | 3.46 |
| 13 | 9.16 | 11.63 | 7.35 | 8.94 | 5.50 | 6.56 | 3.48 | 4.49 | 2.63 | 3.38 |
| 14 | 8.97 | 11.34 | 7.20 | 8.71 | 5.37 | 6.39 | 3.42 | 4.39 | 2.58 | 3.30 |
| 15 | 8.80 | 11.06 | 7.05 | 8.50 | 5.26 | 6.23 | 3.37 | 4.30 | 2.54 | 3.23 |
| 16 | 17.27 | 21.61 | 13.82 | 16.60 | 5.16 | 12.16 | 3.32 | 4.22 | 2.50 | 3.16 |
| 17 | 16.96 | 21.12 | 13.56 | 16.22 | 5.06 | 11.89 | 3.27 | 4.14 | 2.46 | 3.10 |
| 18 | 16.66 | 20.66 | 13.32 | 15.87 | 4.97 | 11.64 | 3.22 | 4.06 | 2.42 | 3.04 |
| 19 | 16.37 | 20.22 | 13.09 | 15.54 | 4.88 | 11.41 | 3.17 | 3.99 | 2.39 | 2.98 |
| 20 | 16.10 | 19.80 | 12.86 | 15.23 | 4.80 | 11.19 | 3.13 | 3.92 | 2.35 | 2.93 |

Legend: "Grace" stands for grace period, "Def" stands for deferment period due to earnings below threshold. All loans are totally repaid. Any additional year of deferment means one year of double repayment beginning on year 20th and up to the last 5 years of the loan.

Table 5 displays the repayment burdens of men and women in different percentiles according to the repayment conditions stated in the second call. According to our estimated incomes, both men and women in the 10th percentile and in the 25th percentile use the maximum deferment period. Their repayment burdens are lower during the first five years of payment but become too large afterwards, reaching 21.61% by year 16 for

women in the 10th percentile. Men in the 50th percentile do not use the deferment, while women in that percentile still use the maximum deferment period of 5 years. Repayment burdens are however much more reasonable, reaching less than 13% by year 16 for women and going down from there. At higher percentiles, both men and women no longer use deferment and repayment burdens are particularly low for men in the 90th percentile not even reaching 3.1% at any point in time. The repayment burden of women at the 90th percentile, who no longer need deferment periods, ranges roughly from 2.93 to 4.14% of gross income.

By making the loans being totally repaid, independently of income, the program managed to recover 50% of the amounts lent to individuals in the lowest percentiles. Even with full repayment, the government or, more precisely, the taxpayer, bears the cost from the grace period and the 0% nominal interest rate. The rate of recovery for the government becomes very similar across the income distribution ranging from 41.73% to 50.31%. However, the increase in maturity raises the cost of the loan of those individuals who were already repaying their loan in full and now had many more years to do the payments. The subsequent extra-cost to the government in terms of interest forgone, nearly doubles from the previous call at the highest quantiles. This can be seen by comparing Table 4 and Table 6.

Table 6: Cost to the government as a percentage of principal per quantile. 2008-2009 call

| Q10 | | Q25 | | Q50 | | Q75 | | Q90 | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| 50.31 | 50.31 | 50.31 | 50.31 | 41.73 | 50.31 | 41.73 | 41.73 | 41.73 | 41.73 |

3.3 Third Call

Repayment conditions toughened in the third call, launched in November 2009, although loans continued to bear a 0% nominal interest rate. The maturity of the loans was reduced to 13 years, with 3 years of grace. After this three-year grace period, the borrower could enjoy a deferment period up to three years if her annual taxable income did not surpass the amount of 22.000 euros, doubling the payment due in the last 3 years (year 11 to 13).

As we can see in Table 7, for women in the 10th percentile, repayments due always exceed 18% of gross income and reach more than 36% by year 11. Both men and women in the 50th percentile use the deferment period, 1 and 3 years respectively. By year 13, they need to devote, correspondingly, 16.49% and 19.68% of gross income to repay the loan, according to our estimated incomes. At percentile 75, nobody uses the deferment period, women pay between 6.7% and 8.62% of their gross income, while men in the same percentile pay between 5.22 and 6.22% of their gross income from year 4 to year 13.

Table 7: Loan repayment burden as a percentage of earnings per quantile, 2009-2010 call.

| | Q10 | | Q25 | | Q50 | | Q75 | | Q90 | |
|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| 1 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 2 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 3 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 4 | Def | Def | Def | Def | Def | Def | 6.29 | 8.62 | 4.87 | 6.69 |
| 5 | Def | Def | Def | Def | 10.41 | Def | 6.14 | 8.35 | 4.73 | 6.44 |
| 6 | Def | Def | Def | Def | 10.05 | Def | 6.00 | 8.09 | 4.61 | 6.21 |
| 7 | 15.70 | 20.73 | 12.79 | 16.10 | 9.72 | 12.02 | 5.87 | 7.85 | 4.49 | 6.00 |
| 8 | 15.32 | 20.09 | 12.44 | 15.56 | 9.42 | 11.56 | 5.75 | 7.63 | 4.39 | 5.81 |
| 9 | 14.97 | 19.48 | 12.12 | 15.06 | 9.14 | 11.15 | 5.63 | 7.42 | 4.29 | 5.64 |
| 10 | 14.64 | 18.92 | 11.82 | 14.60 | 8.89 | 10.78 | 5.52 | 7.23 | 4.19 | 5.48 |
| 11 | 28.64 | 36.79 | 23.08 | 28.35 | 8.66 | 20.87 | 5.41 | 7.06 | 4.11 | 5.33 |
| 12 | 28.04 | 35.81 | 22.55 | 27.56 | 8.44 | 20.25 | 5.32 | 6.89 | 4.02 | 5.19 |
| 13 | 27.47 | 34.88 | 22.06 | 26.82 | 16.49 | 19.68 | 5.22 | 6.73 | 3.95 | 5.07 |

Legend: "Grace" stands for grace period, "Def" stands for deferment period due to earnings below threshold. All loans are totally repaid. Any additional year of deferment means one year of double repayment beginning on year 13th and up to the last 3 years of the loan.

The decrease in loan maturity reduces dramatically the taxpayer subsidy (see Table 8) and reduces even more the differences in the rate of recovery along the income distribution compared to the previous call. Indeed, in the 2008-2009 call there was a difference in the taxpayer subsidy of 8,58 percentage points between those enjoying a larger and a lower subsidy. This difference comes down to 5,86 percentage points in the 2009-10 call (see Tables 6 and 8). The subsidy becomes more similar across individuals although their income could be very different, and this reduces the progressivity of the program. This reflects the fact that subsidising the interest rate usually turns out to benefit better-off graduates (Johnston and Barr, 2013)

Table 8: Cost to the government as a percentage of principal per quantile. 2009-2010 call

| Q10 | | Q25 | | Q50 | | Q75 | | Q90 | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| 31.50 | 31.50 | 31.50 | 31.50 | 28.15 | 31.50 | 25.64 | 25.64 | 25.64 | 25.64 |

3.4 Last Call

In December 2010, a positive nominal interest rate was introduced. Three different loan modalities were allowed depending on the duration of the Master program (60, 90 or 120 ECTS respectively). Loans to pursue a 60 ECTS Master program had a maturity of 6 years (2 of grace, 4 of redemption) and an average nominal interest rate of 2,736. Loans to pursue a 90 ECTS Master program had a maturity of 8 years (3 of grace, 5 of redemption) and a 2,983 average nominal interest rate. Finally, loans to pursue a 120 ECTS Master program lasted for 10 years (4 of grace, 6 of redemption) and had a 3,180 average nominal interest rate.⁸

Table 9: Loan repayment burden as a percentage of earnings per quantile, 2010-2011 call (6-year)

| | Q10 | | Q25 | | Q50 | | Q75 | | Q90 | |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| 1 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 2 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 3 | 25.82 | 35.36 | 20.67 | 26.94 | 16.08 | 20.66 | 9.23 | 12.77 | 7.17 | 9.97 |
| 4 | 25.12 | 34.05 | 20.00 | 25.82 | 15.45 | 19.63 | 9.00 | 12.33 | 6.96 | 9.57 |
| 5 | 24.46 | 32.85 | 19.39 | 24.80 | 14.89 | 18.72 | 8.79 | 11.94 | 6.77 | 9.21 |
| 6 | 23.83 | 31.74 | 18.82 | 23.88 | 14.37 | 17.91 | 8.58 | 11.57 | 6.59 | 8.88 |

Table 10: Loan repayment burden as a percentage of earnings per quantile, 2010-2011 call (8-year)

| | Q10 | | Q25 | | Q50 | | Q75 | | Q90 | |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| 1 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 2 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 3 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 4 | 38.33 | 51.97 | 30.11 | 38.87 | 23.27 | 29.55 | 13.55 | 18.57 | 10.48 | 14.40 |
| 5 | 37.33 | 50.14 | 29.19 | 37.34 | 22.41 | 28.19 | 13.23 | 17.97 | 10.19 | 13.86 |
| 6 | 36.38 | 48.44 | 28.33 | 35.94 | 21.63 | 26.97 | 12.92 | 17.41 | 9.93 | 13.37 |
| 7 | 35.49 | 46.87 | 27.53 | 34.67 | 20.92 | 25.88 | 12.64 | 16.90 | 9.68 | 12.92 |
| 8 | 34.64 | 45.41 | 26.79 | 33.50 | 20.28 | 24.89 | 12.37 | 16.43 | 9.45 | 12.51 |

Table 11: Loan repayment burden as a percentage of earnings per quantile, 2010-2011 call (10-year)

| | Q10 | | Q25 | | Q50 | | Q75 | | Q90 | |
|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| 1 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 2 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 3 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 4 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 5 | 32.13 | 43.16 | 24.81 | 31.74 | 19.05 | 23.96 | 11.25 | 15.28 | 8.67 | 11.78 |
| 6 | 31.31 | 41.70 | 24.08 | 30.56 | 18.39 | 22.92 | 10.99 | 14.80 | 8.44 | 11.37 |
| 7 | 30.55 | 40.35 | 23.40 | 29.47 | 17.79 | 22.00 | 10.75 | 14.37 | 8.23 | 10.99 |
| 8 | 29.82 | 39.09 | 22.77 | 28.48 | 17.24 | 21.16 | 10.52 | 13.96 | 8.03 | 10.64 |
| 9 | 29.13 | 37.92 | 22.19 | 27.57 | 16.74 | 20.41 | 10.30 | 13.59 | 7.85 | 10.32 |
| 10 | 28.48 | 36.82 | 21.64 | 26.72 | 16.27 | 19.73 | 10.10 | 13.24 | 7.68 | 10.02 |

Legend: "Grace" stands for grace period. All loans are totally repaid.

⁸ These interest rates are the average of the annual interest rates quoted every two weeks for each loan modality by ICO (Instituto de Crédito Oficial).

Tables 9 to 11 display repayment burdens corresponding to the three different modalities of loan in the last call of the program. They are clearly too large, with the exception of men in the 90th percentile who pay, for the 6-year loan, around 7% of their gross income. In contrast, the estimated burden for women in the 10th percentile almost reaches 52% of gross income on year 4 under the 8-year loan going down to only 45,41% on the last year of repayment. Both the 6 and the 10-year loan impose a lower, although still too high, burden, slightly over 35% to over 31% in the former case, over 43 to almost 37% in the latter. Similarly the burden is lower for men in the lowest percentiles, it still ranges between roughly 24 and 38%, with the 8-year loan still ranking worse in severity of repayment conditions. The logical counterpart of these severe conditions is that the cost of these loans to the taxpayer reaches a minimum (Table 12). The 6-year loan costs only 10.51% of the principal to the taxpayer, while the 8 and 10 year loans cost respectively 16.88% and 23.54% of the principal. These recovery rates are equal across the income distribution, suggesting that there is room for welfare improvements through redistribution of the burden from individuals at the lowest percentiles to their counterparts in the higher end of the distribution. This can be seen by looking together at tables 9 to 12.

Table 12: Cost to the government as a percentage of principal. 2010-2011 call and amendment.

| | First Call | | Amendment |
|----------|------------|----------|-----------|
| 6 years | 10.51 | 10 years | 20.47 |
| 8 years | 16.88 | 13 years | 27.33 |
| 10 years | 23.54 | 16 years | 34.25 |

A new call, with yet new conditions (a higher nominal interest rate, yet larger maturities) was published in December 2011, but in March 2012 the call was revoked and the program discontinued, allegedly due to lack of demand.

3.5 Amendment to last call

The hard repayment conditions of the 2010 call led to protest and our estimations confirm that they were more than justified, with the only probable exception of men in the 90th percentile of the earnings distribution. In 2013, the grace periods and loan contract maturities were increased. For 60 ECTS Master programs the maturity

increased to 10 years (4 of grace, 6 of redemption). For 90 ECTS Master programs the maturity was increased to 13 years (5 of grace, 8 of redemption). Finally, for 120 ECTS Master programs, maturity was increased to 16 years (6 of grace, 10 of redemption).

Table 13: Loan repayment burden as a percentage of earnings per quantile, Amendment to 2010-2011 call (6-year loan).

| | Q10 | | Q25 | | Q50 | | Q75 | | Q90 | |
|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| 1 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 2 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 3 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 4 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 5 | 17.40 | 23.38 | 13.27 | 16.98 | 10.19 | 12.81 | 6.01 | 8.17 | 4.63 | 6.30 |
| 6 | 16.96 | 22.59 | 12.88 | 16.34 | 9.84 | 12.26 | 5.88 | 7.92 | 4.51 | 6.08 |
| 7 | 16.55 | 21.85 | 12.52 | 15.76 | 9.51 | 11.76 | 5.75 | 7.68 | 4.40 | 5.88 |
| 8 | 16.15 | 21.17 | 12.18 | 15.23 | 9.22 | 11.32 | 5.63 | 7.47 | 4.29 | 5.69 |
| 9 | 15.78 | 20.54 | 11.87 | 14.74 | 8.95 | 10.91 | 5.51 | 7.27 | 4.20 | 5.52 |
| 10 | 15.43 | 19.95 | 11.57 | 14.29 | 8.70 | 10.55 | 5.40 | 7.08 | 4.10 | 5.36 |

Tables 13-15 display the burdens implied by the new conditions. Although clearly better, the repayment burden is still excessive for most individuals and too low for some, as for example, men in the 90th percentile with a 10 (former 6 year) year loan who only pay between 4.1 and 4.63% of their gross income. The 13 year loan (former 8 year) is still the one implying worse repayment conditions, with women in the 10th percentile now paying roughly between 27 and 33% of their gross income to repay their student loans during 8 years.

Table 14: Loan repayment burden as a percentage of earnings per quantile, Amendment to 2010-2011 call (13-year loan).

| | Q10 | | Q25 | | Q50 | | Q75 | | Q90 | |
|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| 1 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 2 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 3 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 4 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 5 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 6 | 25.04 | 33.34 | 18.48 | 23.45 | 14.11 | 17.59 | 8.43 | 11.36 | 6.47 | 8.72 |
| 7 | 24.42 | 32.26 | 17.96 | 22.61 | 13.65 | 16.88 | 8.24 | 11.02 | 6.31 | 8.43 |
| 8 | 23.84 | 31.25 | 17.47 | 21.85 | 13.23 | 16.24 | 8.07 | 10.71 | 6.16 | 8.16 |
| 9 | 23.29 | 30.32 | 17.02 | 21.15 | 12.84 | 15.66 | 7.91 | 10.43 | 6.02 | 7.92 |
| 10 | 22.77 | 29.44 | 16.60 | 20.50 | 12.49 | 15.13 | 7.75 | 10.16 | 5.89 | 7.69 |
| 11 | 22.28 | 28.62 | 16.21 | 19.91 | 12.16 | 14.66 | 7.60 | 9.91 | 5.77 | 7.48 |
| 12 | 21.81 | 27.86 | 15.84 | 19.35 | 11.86 | 14.22 | 7.47 | 9.68 | 5.65 | 7.29 |
| 13 | 21.37 | 27.14 | 15.49 | 18.83 | 11.58 | 13.82 | 7.34 | 9.46 | 5.54 | 7.11 |

The constant recovery rate across the income distribution of graduates remains unchanged and again, affects all individuals equally. The increase in maturity by 4, 5 and 6 years respectively rises the taxpayer subsidy accordingly. The subsidy provided by the government in this call is very similar to the 2009-2010's but the burden imposed on students is much higher. With the same budget effort the government would be either making harder access to the program for individuals at the lowest percentiles or reducing importantly their disposable income after covering loan repayments.

Table 15: Loan repayment burden as a percentage of earnings per quantile, Amendment to 2010-2011 call (16-year loan).

| | Q10 | | Q25 | | Q50 | | Q75 | | Q90 | |
|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women |
| 1 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 2 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 3 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 4 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 5 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 6 | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace | Grace |
| 7 | 20.57 | 27.17 | 14.91 | 18.78 | 11.33 | 14.01 | 6.85 | 9.15 | 5.24 | 7.00 |
| 8 | 20.08 | 26.32 | 14.51 | 18.15 | 10.98 | 13.48 | 6.70 | 8.90 | 5.12 | 6.78 |
| 9 | 19.62 | 25.54 | 14.13 | 17.56 | 10.66 | 13.00 | 6.56 | 8.66 | 5.00 | 6.57 |
| 10 | 19.18 | 24.80 | 13.78 | 17.03 | 10.37 | 12.57 | 6.44 | 8.44 | 4.89 | 6.39 |
| 11 | 18.77 | 24.11 | 13.46 | 16.53 | 10.10 | 12.17 | 6.31 | 8.23 | 4.79 | 6.21 |
| 12 | 18.37 | 23.46 | 13.15 | 16.07 | 9.85 | 11.81 | 6.20 | 8.03 | 4.69 | 6.06 |
| 13 | 18.00 | 22.86 | 12.86 | 15.64 | 9.62 | 11.48 | 6.09 | 7.85 | 4.60 | 5.91 |
| 14 | 17.64 | 22.29 | 12.59 | 15.24 | 9.40 | 11.17 | 5.99 | 7.68 | 4.52 | 5.77 |
| 15 | 17.30 | 21.75 | 12.33 | 14.87 | 9.20 | 10.90 | 5.89 | 7.52 | 4.44 | 5.64 |
| 16 | 16.98 | 21.24 | 12.09 | 14.52 | 9.02 | 10.64 | 5.80 | 7.37 | 4.37 | 5.53 |

Legend: "Grace" stands for grace period. All loans are totally repaid.

4. Concluding remarks

The debate over the convenience of using student loans to fund higher education in Spain is not over. In times of austerity and in the presence of other social programs, deserving perhaps higher priority, one needs to acknowledge the advantages of an instrument that allows the recovery and reinvestment of part of the spent resources. It is however extremely important that loans do not impose an excessive burden on graduates. The program Préstamos Renta Universidad provided master's students in Spain with loans to pay university fees and a monthly payment for living expenses along the duration of the master program. As we have seen, only the first call did not impose excessive burdens on some individuals. The counterpart of this fact is that, according to earnings estimates based on 2008 data, the Program was in fact a subsidy

for low earners, with the cost to the government ranging from 100% at the 10th and 25th percentile to slightly over 22% at the 90th percentile. This 22% would be the cost to the government even if all borrowers repaid the loan in full due to the interest subsidy and the grace period.

Starting with the second call (2008-2009) conditions were designed to guarantee full repayment of the loan at 0% nominal interest rate. Yet, since the maturity was increased to 20 years, the interest subsidy implied that, again, the cost to the government ranged between 40 and 50% of the principal lent. This second call imposed burdens higher than 16.5% for men at the 10th percentile of the earnings distribution and for women on the 25th percentile. The burden was larger than 21% for women in the 10th percentile. At the 75th and 90th percentile, repayment burdens were however too small, even lower than under the conditions implied by the first call. The second call was therefore too tough on low earners and mild for high earners while still imposing a heavy burden to the taxpayer. Further attempts to reduce tax subsidies managed to reduce them at the cost of increasing the repayment burden of low earners to unbearable levels, reaching almost 52% of estimated gross earnings for women in the 10th percentile repaying the 8 year loan under the 2010-11 call (fourth year).

We can thus say that only the first call provided some sort of progressive conditions. The tax subsidy ranged from 100% in the lowest percentiles to 22.64% in the top of the distribution. In contrast, subsequent calls reduced the taxpayer subsidy but at the same time distributed the burden equally across the income distribution, imposing an excessive burden on the lowest percentiles.

New proposals for student loans in Spain should rely on conclusions drawn from experience at international level. A good loan program should bear no general interest subsidies or grace periods. In contrast, repayment conditions should be eased only for those in need. Also, repayment periods should be long enough to provide a sufficient investment recovery rate to the government, hence limiting unnecessary taxpayer subsidies.

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