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The Fiscal Effects of Uncapping Social Security Contributions: Implications for Pension Reform in Spain

Ferran Elias[1]
University of Valencia
Marc Riudavets-Barcons[2]
University of Helsinki

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[1] ferran.elias@uv.es
[2] marc.riudavetsbarcons@helsinki.fi

Los efectos fiscales de destopar las contribuciones a la seguridad social: implicaciones para la reforma de las pensiones en España

Resumen. En este artículo estimamos los efectos fiscales del destope de las cotizaciones a la seguridad social en España. Este ejercicio no es trivial porque no hay datos públicos disponibles sobre salarios por encima del nivel máximo de cotización. Sin embargo, en 2019 una reforma aumentó el tope cerca de un 7% y reveló parcialmente la forma de la distribución para los trabajadores con salarios altos. Explotamos esta variación y mostramos que el destope podría aumentar los ingresos de la seguridad social en un 0,22% del PIB. A continuación, discutimos las implicaciones de esta estimación para la reforma de las pensiones. Combinado con un aumento en las tasas de contribución de 0,6 puntos porcentuales (Mecanismo de equidad intergeneracional) y una regularización de los inmigrantes indocumentados, los ingresos totales recaudados podrían pagar el 44 % del aumento esperado en el gasto de pensiones para 2030.

Palabras clave: Pensiones, Seguridad Social.
Clasificación JEL: H55, I38, J26.

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Abstract. We estimate the fiscal effects of uncapping social security contributions in Spain. Such exercise is not straightforward because there is no public data available on wages above the maximum contribution level. Nevertheless, in 2019 a reform in- creased the ceiling by about 7% and partially unveiled the shape of the distribution for high-wage earners. We exploit this variation and measure that uncapping could increase social security revenue by 0.22% of GDP. We discuss the implications of this estimate for pension reform. Combined with an increase in contribution rates of 0.6 percentage points (Mecanismo de equidad intergeneracional) and a regularization of undocumented immigrants, the overall revenue raised could pay for 44% of the expected increase in pension expenditure by 2030.

Keywords: Pensions, Social-security.
JEL codes: H55, I38, J26.

1. Introduction

The sustainability of public pension systems is one of the key challenges that many economies face today. In the OECD, the average spending on pension benefits increased from 6.6% of GDP to 7.7% between 2000 and 2017. This spending is predicted to further increase in the coming years. For OECD countries, it is projected to represent, on average, around 10% of the GDP by 2035 (OECD, 2021). In Spain, this situation is particularly worrying as the level of spending is already at 10.9% of the GDP in 2020 and it is projected to be at 14.2% by 2050 (AIReF, 2020).

During the last decades, governments have tried to reduce expenditure on public pensions through several means. For instance, two policy changes that have been high in the reform agenda are the increase in the retirement age or the reduction of the real monthly pension stipend (OECD, 2015, 2017, 2021). Nevertheless, much less attention has been paid to the implication of reforms that would increase social security contributions (SSC) to finance the additional pension expenditure (Conde-Ruiz and González, 2016). In Spain, the possibility of raising SSC is notably relevant because both workers and employers contribute according to the worker's wage, but up to a maximum basis[3]. Hence, wages above this basis participate proportionally less in financing social security and constitute a potential source of additional revenue. However, knowing how much extra money the government can obtain in this manner is not a straightforward exercise, since there is no publicly available dataset with information on wages above the maxi- mum basis.

This paper bridges this gap and quantifies the amount of additional social security money that can be raised by increasing social security contributions. To do so, we exploit a reform in Spain. In January 2019, the government increased the maximum contribution basis by 7%. In particular, in December 2018 it was set at 3803.7 euros and in January 2019 it was at 4070.1 euros. This policy change provides a unique setting to estimate the potential increases in payroll tax collection of uncapping the system of SSC in Spain. That is, of removing the maximum basis or moving it to higher wage levels.

We use an administrative dataset from social security records in Spain (Muestra Con- tinua de Vidas Laborales). This is the only dataset that provides precise wage information at the cent level for the Spanish labor market, up to the maximum basis.

We estimate that uncapping SSC can increase revenue by 0.22% of GDP or 18.3% of the expected increase in pension expenditure in 2030 (AIReF, 2020). The details of the empirical exercise we perform are the following. First, we calculate the overall increase in payroll tax collection implied by the policy change in January 2019[4]. Second, we compute how much additional payroll tax collection was originated for each euro increase in the maximum basis. Third, armed with this information, we make projections about how much could social security revenue raise if we were to increase the maximum basis further above than its January 2019 level.

In addition to the exercise just described, we also measure the effects on social security funds of increasing the contribution rate by 0.6 percentage points, as planned by the Spanish government in law 21/2021. In that case, the increase is of 0.17% of GDP or 14.17% of the predicted increase in 2030 (AIReF, 2020). Thus, around 32.47% of the additional money

[3] The SSC statutorily paid by the employers represented a 8.6% of the GDP while the SSC statutorily paid by the workers represented a 3.2% of the GDP.

[4] We estimate that that increase raised SSC by about 1436 million euros per year (0.115% of Spain's GDP).

needed to pay for the increase in public pensions can be raised with these two reforms combined.

We finish this article with a discussion of the implications of the estimates for pension reform. While a 32.47% is clearly insufficient to fund the expected increase in pension expenditure, it is a sizable amount that is worth taking into account for the design of policy changes that want to keep the purchasing power of pensioners. Moreover, relying on Elias et al. (2022) and Fanjul and González-Iniesta (2022), we measure that SSC can be further increased by a regularization of undocumented immigrants. In particular, the combination of the three reforms could raise funds to 44% of the expected expenditure increase (AIReF, 2020).

The paper is organized as follows. In section 2 we present the dataset we use as well as relevant summary statistics for the group of workers we focus on. Section 3 describes the Spanish public pension system, the way it is funded, and its most recent reforms. Section 4 explains the method we use and shows the results. Finally, in section 5 we discuss the estimates in light of recent debates about the sustainability of the public pension system.

2. Data

We use data from the the Continuous Sample of Work Lifes (MCVL, by its acronym in Spanish) between 2018 and 2019, a dataset that combines administrative information from three main sources: the social security administration, the census and tax administration in Spain.

The MCVL provides representative, unique and high-quality data on the Spanish Labour Market. It contains detailed information on the start and end of each employment or unemployment spell along with the type of contract, monthly wages, contribution regime and contribution basis which we can use to calculate the SSC levied from each contract[5]. Additionally, the data also contains background and socioeconomic information on the individuals in the sample.

The MCVL sample is constructed in the following way: for example, in 2018, 4% of all individuals who had some relationship with the social security that year were randomly selected. For each individual included, the data contains all information on her labor history including periods where the individual collects unemployment benefits or after retirement, when the individual starts receiving pension benefits. These same individuals are then followed over time unless their relation with the social security ends (this means they are either out of employment, do not collect unemployment benefits or die). In that case, the worker is replaced with another randomly selected individual who is on a relation with the social security that year[6]. For this paper we use the years 2018 and 2019, the period when the SSC ceiling increased by 7%.

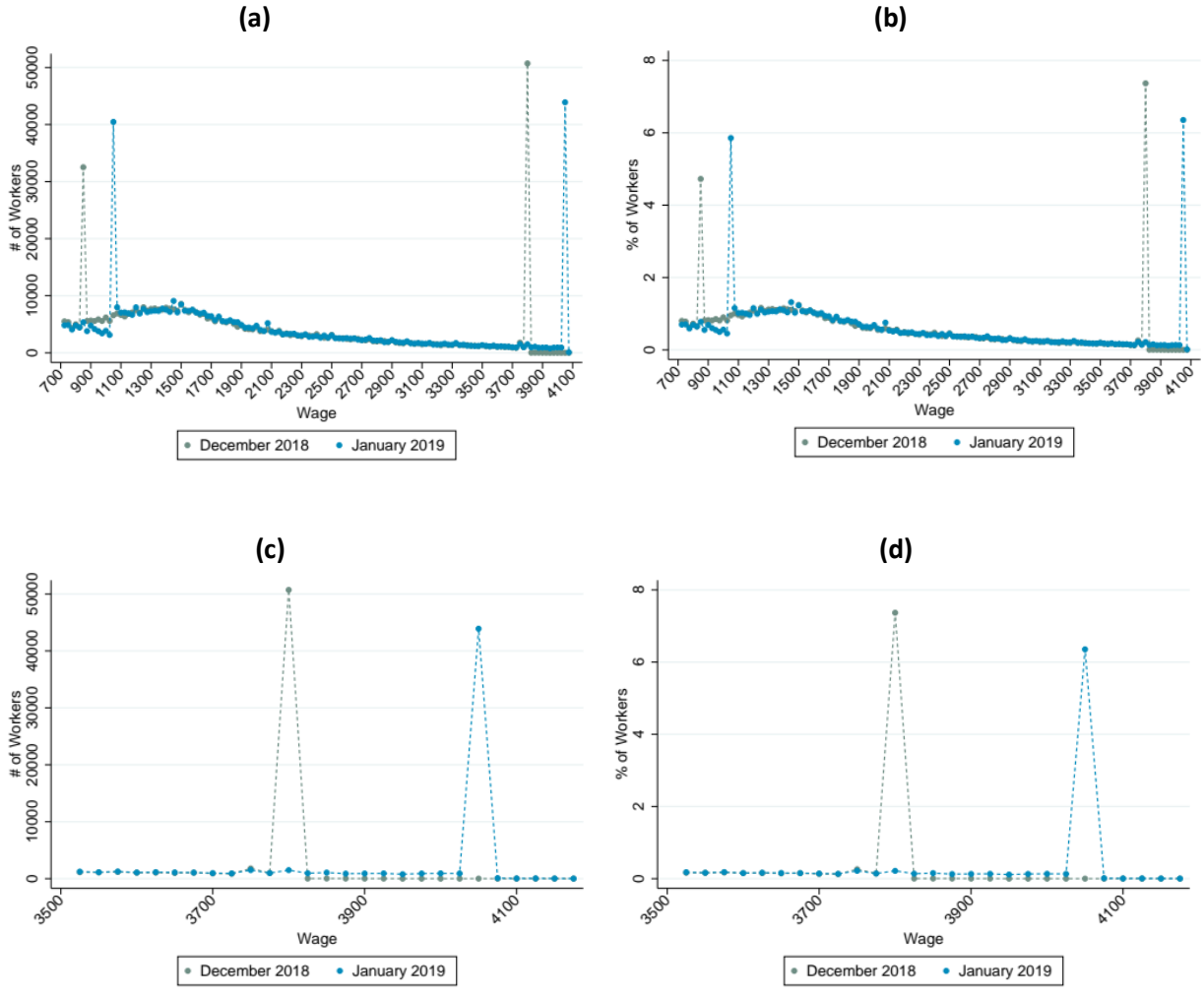
In Figure 1 we plot the wage distributions in December 2018 and January 2019, the months before and after the update of the minimum wage and the maximum contribution

[5] SSC are paid by both the employers and employees as a percentage of the worker's wage. For detailed information see section 3.2.

[6] The first edition of the MCVL was assembled in 2004. Hence, some of the individuals included in the 2018 edition were included in the sample in a previous edition. From that moment, they are included in the dataset as long as they have a relationship with the social security system. Sampling was random, without any kind of stratification. A relation with the social security is understood as the individual being either formally employed, or a receiver of either unemployment benefits or a contributory pension.

basis. Panels (a) and (b) show the wage distribution between the minimum wage and the ceiling, which delimit SSC before and after the reform. Panels (c) and (d) zoom in the upper part of the wage distribution. There are two facts worth highlighting about the figures. First, workers bunch both at the minimum wage and the ceiling. Around 30,000 workers or 5% of the workforce were at the minimum wage in 2018. These numbers increased to around 40,000 employees or 6% in 2019 after the increase in the minimum wage. In 2018, around 50,000 workers (about 7%) were at the maximum basis, and this decreased to a bit less than 45,000 workers (6%) in 2019. The second fact is that the increase in the maximum contribution basis in 2019 unveiled the shape of the wage distribution for salaries above 3803.70 euros, the maximum basis in 2018. This is better displayed in panels (c) and (d). Note that for workers with wages lower than the 2018 maximum basis, the green- and blue-dotted lines overlap. However, above the maximum basis in 2018, the lines are not on top of each other anymore and the blue dots are above the green ones. This is the variation that we exploit in section 4 to estimate the effects of uncapping SSC.

Figure 1. Wage Distributions



Note: This figure illustrates the wage distributions in December 2018 and January 2019. Panel (a) and (b) illustrate the whole wage distribution, while panel (c) and (d) zoom in on the right tail, where the ceiling in the SSC is set.
Source: Own elaboration.

In Table 1 we present descriptive statistics of these workers and compare them to the rest of the sample. Male workers born in Spain are over represented in the upper part of the wage distribution. Also, workers in this part of the wage distribution have better working conditions: there is a higher share of permanent contracts (77.7% vs 59.5%) and almost all of them are full time (97.5% vs 74.85%). They are also more likely to work in larger firms. Moreover, there is a major fraction of individuals who are public workers (19.23% vs 7.36%). Very few of them work in the agriculture or housekeeping sectors compared to the rest of the population (0.3% vs 5.4% and 0% vs 3.2% respectively). In contrast, the share of workers in the industry sector is higher, 18.6% vs 11.6%. Finally, the share of employees in the service sector is similar for both groups.

Table 1: Descriptive Statistics

	(1) Workers at 2018 Maximum Basis		**(2) Workers Earnings Less than 2018 Maximum Basis**	
	Mean	SD	Mean	SD
A. Demographic Characteristics				
% Women	33.552	47.218	49.465	49.997
% Spanish Citizens	96.031	19.524	88.476	31.931
B. Contract Characteristics				
% Permanent Contract	77.797	41.562	59.538	49.082
% Short-Term Contract	2.974	16.986	33.106	47.059
% Public Worker	19.230	39.411	7.356	26.106
% Full-Time Workers	97.567	15.408	74.848	43.389
# Workers in Firm	1309.967	2822.582	668.331	2449.695
% Agriculture	0.343	5.848	5.406	22.614
% Industry	18.652	38.953	11.684	32.123
% Construction	2.627	15.993	5.353	22.508
% Services	76.809	42.206	75.051	43.272
% Housekeeping	0.000	0.000	3.217	17.646
Observations	50713		637619	

Notes: This Table presents summary statistics for the set of workers who were working in December 2018. Column (1) describes the workers who were at the maximum basis in 2018 and column (2) describes the restof the workforce.
Source: Own elaboration.

3. Institutional Setting

This section is structured in two parts. In subsection 3.1 we explain the main characteristics of the pension system in Spain and the reforms that have been adopted during the last years. In subsection 3.2, we discuss how the system is funded.

3.1. The Spanish Pension System

Spain has a pay-as-you-go public pension system: active workers pay the contributions that cover the benefits of retired employees. Its foundations were set in the Pacto de Toledo in 1996. The main points of that agreement were: (1) contributory pensions should be financed exclusively with SSC and non contributory pensions should be financed via general taxes, (2) there should be proportionality between what a person contributes and her pension, (3) pensions should be updated so that purchasing power does not decrease, and (4) a common reserve fund was created to attenuate cyclical fluctuations (Zubiri, 2016).

Figure 2 panel (b) plots the evolution of SSC revenues and pension expenditure as a percentage of the GDP in Spain. While revenues remained constant before the COVID-19 pandemic, there was an increase in expenditure. This is a consequence of two main factors: first, the ageing of the Spanish population, which increases the share of pensioners relative to the overall active population. Second, the economic crisis, which decreased GDP and, hence, increased the relative weight of pensions in the economy. Predictions about the future evolution of spending confirm that the increase in pension costs is likely to continue. For example, the Independent Authority for Fiscal Responsibility (AIReF) estimates in their baseline scenario that spending on the public pension system will rise from 10.9% of the GDP in 2019 to 12.1% in 2030 and to 14.2% in 2050.

Two recent reforms, in 2011 and 2013, introduced several changes to contain the rising pension costs. Both of them have reduced the burden that pensions represent by either cutting the size of the lifelong pension or by reducing the amount that is paid each month. The reform in 2011 introduced five main changes: first, the age of retirement increased from 65 to 67 years old; second, the years of work used to compute the replacement rate increased from 15 to 25; third, there was an increase in two years to be eligible for the full pension; fourth, a reform that equalized the weights that each year had in the replacement rate calculation[7]; finally, a sustainability factor was introduced to reduce pension spending with life expectancy increases[8].

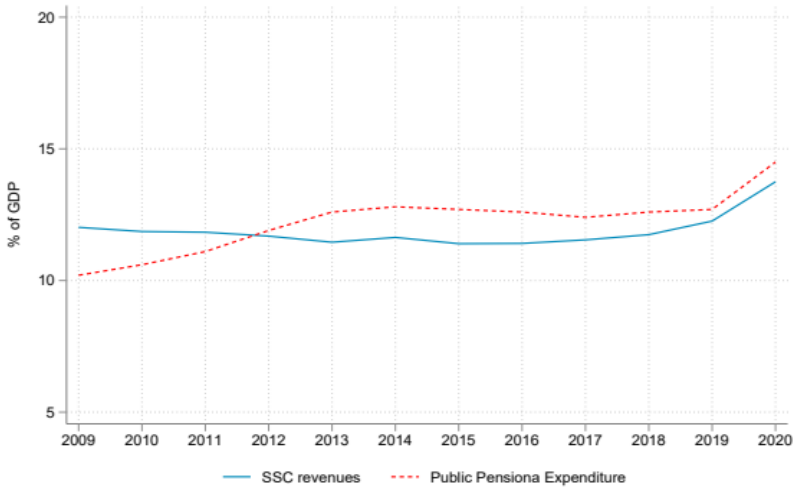
The second major reform happened in 2013, consolidating the direction of the 2011 policy change. It focused on two key aspects. First, it made the sustainability factor more precise than in its 2011 wording. Specifically, the calculation of the replacement rate would be linked to the life expectancy at 67 years old. Because of the increase in life expectancy at that age, this measure reduces pension payments. The second key change was that the yearly updates of pension stipends were delinked from the consumer price index (CPI). Instead, a new index, known as reevaluation index, became the reference. The reevaluation index implies that any increase in SSC cannot be fully translated into higher pension spending, since it will be lowered by three factors: the share of new pensioners, the increase in the average pension, the money spent to reduce the system's deficit[9].

[7] The minimum number of contribution years to receive a pension remained unchanged: 15 years (which granted the right to access to the 50% of the pensions). However, before the reform each of the first 10 years had a weight equal to 3.5% of the pension and the remaining 10 contributed a 2%. After the reform, each year had the same weight: 1.9%.

[8] In 2011 a set of contingent measures were also adopted. Pensions updates were frozen between 2011 and 2012, an increase of 1% was set for 2013 and in 2014-2015 instead of linking the update with the consumer price index (CPI), they were reevaluated by 0.25%. Also, the limit to use only a 3% per year of the common reserve fund was eliminated.

[9] The reevaluation index is capped by a floor (0.25%) and a ceiling (CPI + 0.5%).

Figure 2. Evolution of Pension Expenditure and SSC Revenues in Spain



Note: This figure illustrates the evolution of pension expenditures (red dashed line) and revenues from the SSC (blue line)in Spain between 2009 and 2020. Pension expenditure is defined as the sum of the following social benefits: disability pension, early-retirement due to reduced capacity to work, old-age pension, anticipated old-age pension, survivors' pension and early-retirement benefits for labour market reasons.
Source: Eurostat.

In 2021 a new reform was approved. This one included measures that reverted some of the effects of previous reforms. First, it eliminated the reevaluation index and linked the yearly updates with the CPI again. Second, the reform also included an intergenerational equity mechanism (IEM) to replenish the common reserve fund, because during the Great Recession and its aftermath it lost most of its money. The IEM replaced the sustainability factor, which was eliminated. This new mechanism is an additional SSC of 0.6 percentage points to be implemented between 2023 and 2032.

3.2. Social Security Contributions

Social security contributions in Spain are paid as a percentage of the worker's wage and it is shared between the employers and the employees. Table 2 shows how the tax rate was divided between them in 2018 and 2019. It also includes the contribution rate of the IEM. Formally, the majority of the burden falls on the employer. However, in practice, different studies point to the direction that these costs are potentially passed through to workers in form of lower wages (Melguizo and González-Páramo, 2013).

In Spain, SSC are limited by both a floor and ceiling. This contribution basis limits are revised each year by the government and different workers have different floors depending on their professional category. However, the ceiling is common across contribution regimes. Table 3 shows how the contribution bases were updated for each of the contribution regimes between 2018 and 2019. In general, updates to the SSC ceiling are tied to the yearly revision of the minimum wage. Most years, this revision is very close to zero or around the inflation rate. However, in 2019 the minimum wage was increased by 22%, almost 200 euros, and hence, the maximum basis also increased much more than in previous years. Specifically it moved 267 euros up, or a 7% increase, as was explained in section 2 and shown in figure 1.

Table 2. Payroll Tax Basis 2018 and 2019

Contingencia	**Employer**	**Employee**	**Total**
Contingencias comunes	23.6	4.7	28.3
Fogasa	0.2		0.2
Formación profesional	0.6	0.1	0.7
Unemployment (1)	5.50	1.55	7.05
Total	29.5	6.35	36.25
Intergenerational Equity Mechanism	0.5	0.1	0.6
Total after 2023	30.4	6.45	36.85

Notes: This Table presents how the SSC rate is formally shared between the employers and employees. Also, it shows the tax rate that corresponds to each of the benefits that the Social Security finances.
Source: Own elaboration.

Table 3. Payroll Tax Basis 2018 and 2019

Worker Group	Minimum Base 2018	Minimum Base 2019	Maximum Base 2018	Maximum Base 2019
Engineers and university graduates	1199.10	1466.40	3803.70	4070.10
Technical engineers	994.20	1215.90	3803.70	4070.10
Chief administrative	864.90	1057.80	3803.70	4070.10
Non-graduated assistants	858.6	1050	3803.70	4070.10
Admin. officials, subordinate employees and admin. assistants	858.6	1050	3803.70	4070.10
1st-, 2nd- and 3rd-order officials. Employer under 18 years (1)	28.62	35	126.79	135.67

Notes: This table presents the minimum and maximum contribution basis for each of the contribution regimes for both 2018 and 2019. (1): The unemployment contribution rate is higher for short-term contracts. In this case, the employer faces 6.7 rate and the employee a 1.6 rate.
Source: Own elaboration.

4. Method and Results

In this section we explain the methods we use to estimate the effects of uncapping SSC. We begin by calculating the effect of the 2019 increase in the maximum contribution basis on payroll tax collection in section 4.1. The variation generated by this reform is what we use to quantify the effects of eliminating the maximum contribution basis, which we explain in section 4.2. We end in section 4.3 with a calculation of the fiscal effects of the Intergenerational Equity Mechanism.

4.1. Increase in Payroll Tax Collection after 2019 Rise in Maximum Basis

We estimate that social security revenue increased by about 1436 million euros per year, or 0.115% of Spain's GDP that same year[10]. The details of the computation are summarized in the following formula:

$$\textit{Additional payroll tax} = 25 \times \sum_{i>\textit{2018 MB}} t(\textit{Wage}_i - \textit{2018 Maximum Basis}$$

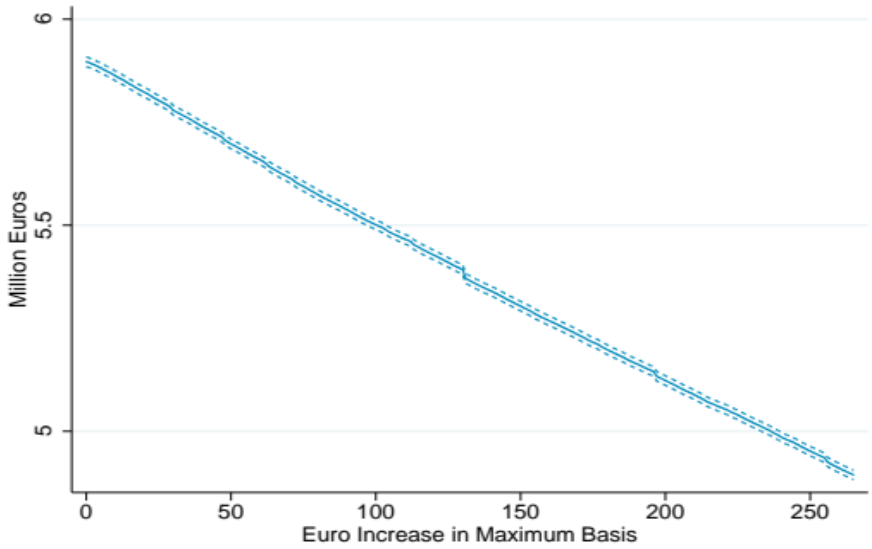
where $Wage_i$ is either the actual wage or the 2019 maximum basis. We sum over all workers whose wage in 2019 is above the 2018 maximum basis (MB). t is the payroll tax rate, which is 36.25% for workers in open-ended contracts and 37.5% if they are in a short-term contract. We multiply by a factor of 25 because the MCVL is a 4% sample.

In the second step, we calculate how much of the 1436 million euros increase corresponds to each euro that the maximum basis was moved up. The results are displayed in Figure 3. As can be observed, the relationship resembles a line with negative slope. In fact, we fit a line to the data to learn more about the features of this linear relationship. The specification we run is:

$$y_k = \alpha + \beta AdditionalEuro_k + \epsilon_k \qquad (1)$$

where y_k is the additional payroll tax collected in each euro bin k and $AdditionalEuro_k$ represents the number of euro increases of the maximum basis.

Figure 3. Increase in Payroll Tax Collection



Note: This figure illustrates the relation between SSC and each of the additional euro increases in the maximum contribution basis. The blue line represents the estimated values while the blue dashed lines depict the 95% confidence bandwidth.
Source: Own elaboration.

[10] Both numbers are significant. The standard errors are 1.55 for the estimate in million euros and 0.0001 for the estimate in percentage terms of GDP. The standard errors in each exercise are obtained using a bootstrapping procedure.

Table 4 displays the results from fitting a linear regression to the data. Column 1 shows estimates when the dependent variable is in euro units and column 2 when it is in log euro units. As can be seen, the negative relationship is significant in both cases. The interpretation is the following: by increasing the maximum basis, we expect to collect more payroll tax revenue, but in a decreasing manner. For each euro increase in maximum basis, we expect that the additional tax revenue decreases by around 3800 euros or 0.07%.

Table 4: Fitting the Line

	Additional Payroll Tax Revenue	Log Additional Payroll Tax Revenue
	(1)	(2)
Additional Euro	-3793.1***(7.244)	-0.000705*** (0.000000563)
Constant	5885668.1***(1113.5)	1.775*** (0.0000866)
Observations	267	267

Notes: This Table presents the additional revenue that can be raised for each euro increase in the maximum basis. The specification is equation 1. Column (1) displays the results when the dependent variable is in euro units and column (2) displays the results when the dependent variable is in log euro units. Standard errors are shown in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.
Source: Own elaboration.

4.2. The Effect of Uncapping Social Security Contributions: Projection Based Results

We use the coefficients from the linear regression to project the additional payroll tax revenue that can be collected by uncapping payroll taxes. The results are based on specification 1 and are shown in figure 4. Panel A shows tax collection in absolute terms and panel B relative to Spain's GDP in 2019. The red dot on the right of each figure shows the increase that happened between 2020 and 2022. We plot this value as a benchmark for the increases that we simulate. Since they are quite similar in size or even lower, we consider that the simulated increases in payroll tax collection are plausible, as long as they are implemented over time.

As expected, the increase in payroll tax revenue is decreasing with the maximum basis. The estimates point to an increase over 400 million euros for the first 100 euro in- crease, or 0.035% of GDP. Furthermore, the increase in payroll tax collection is expected to converge to 0 after moving up the maximum basis by about 1200 euros[11]. Overall, and assuming all extra tax revenue is dedicated to cover pensions expenditure, we estimate that an additional 0.22% (0.001) of revenue can be raised by uncapping social security contributions[12],[13].

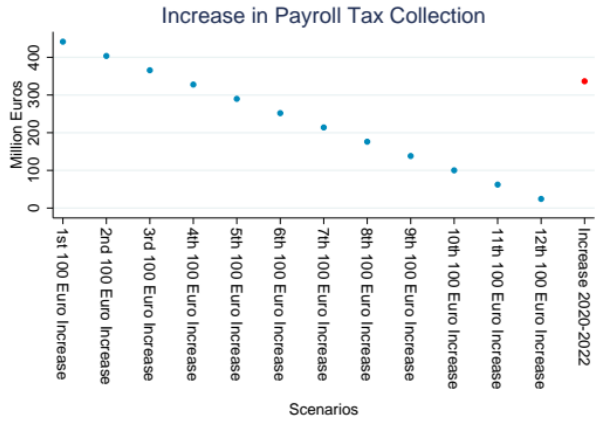
[11] The implication of this is that there are no workers earning more than 5,300 euros in Spain. Obvi- ously, this is not true but a consequence of the linearity assumption of the method we have followed. Future research fitting a power law to the wage distribution would be a promising avenue to correct the approximation error caused by the linearity assumption.

[12] When we calculate the raise of 0.22%, we assume that all additional money collected would be spent on pensions. This is at odds with the current contribution rates (table 2) but an uncapping reform could also

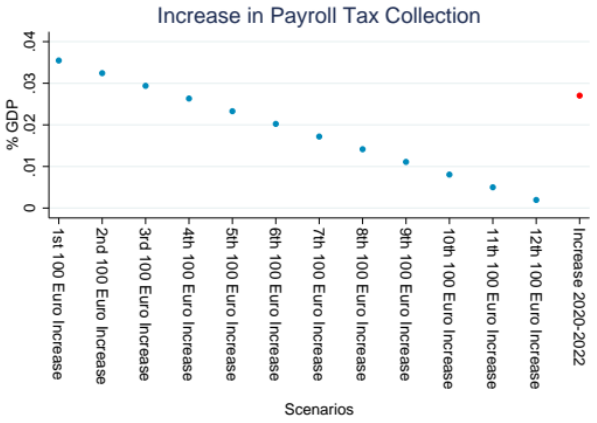
A limitation of this approach is that we are not considering the potential negative effects on employment of the increase in labor costs. Thus, the estimate we provide is probably an upper bound. However, in appendix A we explore whether in 2019 there were less workers in the area around the maximum basis as a result of the movement up of the maximum basis. We do not find evidence to support this point. Nevertheless, it could be that high-wage earners are not the ones that suffer job losses after the increase in the ceiling, an issue that we cannot discard with the data and exercises we perform.

Figure 4. Increase in Payroll Tax Collection if Maximum Basis is Further Increased

(a) Million Euro Increase in Payroll Tax Collection



(b) Percentage Increase in Payroll Tax Collection



Note: This figure illustrates the increase in payroll tax collection for several 100 euro increases in the maximum basis. Panel (a) displays it in millions of euros and panel (b) as a percentage of GDP. Each red dot in the figure represents the actual increase in payroll tax collection from the maximum basis increase between 2018 and 2019. Dots represent the point estimates while the vertical capped lines represent the 95% confidence intervals.
Source: Own elaboration.

4.3. The Effects of Increasing All Contributions by 0.6 Percent- age Points

In addition to calculating the effect on payroll tax collection, we also compute the effects of the mecanismo de equidad intergeneracional (MEI), proposed by PSOE in law 21/2021 as a mechanism to fund the social security reserve fund from 2023 and until 2032. Specifically, the proposal implies an increase in the social security contribution rate of 0.6pp. The results we obtain measure an increase in tax collection equivalent to 0.1713% (0.00003) of Spain's GDP. The calculation is based on the following equation:

$$Revenue_{MEI} = 25 \times \sum_{i=1}^{N} Wage_i \times 0.6 \qquad (2)$$

where we sum the additional payroll tax paid by each worker according to their wage, up to the maximum contribution basis.

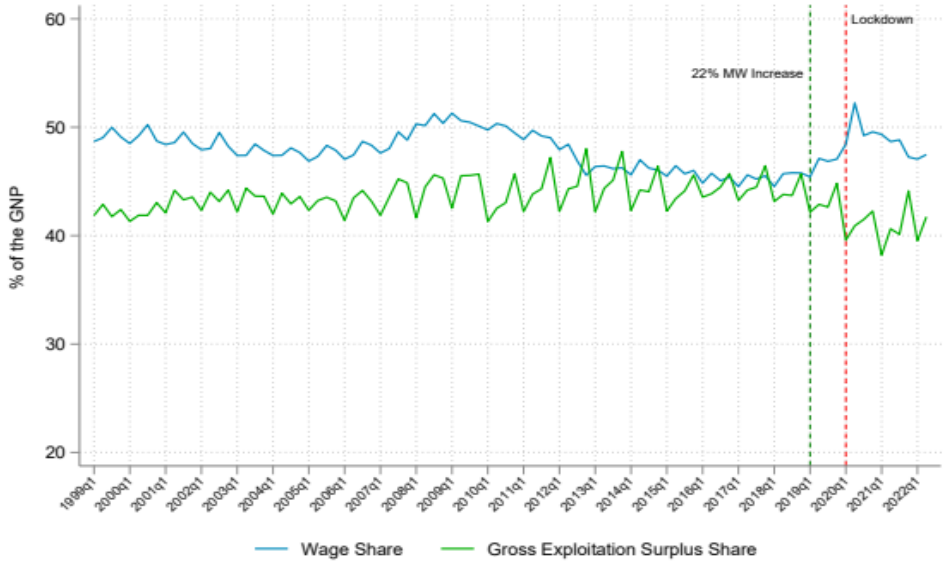
establish that the revenue coming from a certain wage level would only be spent on pensions or saved in the reserve fund.

[13] We have computed the uncapping fiscal effect with the contribution rates in table 2 without consid- ering the intergenerational equity mechanism. Including it changes the estimates slightly. Overall collection increases from 2,795 million euros to 2,841, and in relative terms from 0.2245% to 0.2283%.

5. Discussion

Pension expenditure, relative to GDP, depends on three main variables: first, the demographic evolution. The higher the share of retired people, the higher the expenditure. Second, the employment rate. If it decreases, GDP shrinks, increasing the relative effort made to pay the pensions. Third, the percentage of GDP that wages represent. For the case of Spain, predictions about the ageing of its population (AIReF, 2020) and the decreasing trend of the wage share (see Figure 5) are the most important concerns regarding the sustainability of the pension system as it exists today[14].

Figure 5. Evolution of the Wage and Gross Exploitation Surplus Share in Spain



Note: This figure illustrates the evolution of the wage share (blue line) and the gross exploitation surplus share (green line) in Spain between 1999 and 2022. Wage share is defined as the total compensation in wages and non-pecuniary benefits that employers have to pay to their workers divided by the Gross National Product. The Gross Exploitation Surplus Share is defined as the income received by production units, excluding labor, divided by the Gross National Product.
Source: Spanish National Institute of Statistics (INE).

In fact, during the last decade there have been many pension reforms, as explained in section 3. All of them have introduced changes that reduce pension expenditure today and will continue to reduce it as new workers retire. The 2021 reform is an exception since it also included measures that increase the pension bill. Mainly, the updating of pension stipends according to the CPI.

Nevertheless, another reform option is to increase SSC to fund the additional expenditure needed. The aim of this paper has been to shed light on the plausibility of such reform track. We measure that additional revenue equivalent to 0.22% of GDP can be raised by uncapping SSC. Another 0.17% will be raised by the increase of 0.6 pp of the contribution

[14] Figure 5 plots the evolution of the wage share and the gross exploitation surplus share with respect to the GNP. The wage share lost around 5 pp between 2009 and 2018. The trend was reverted after the 2019 increase in the minimum wage and during the COVID-19 lockdown. Nevertheless, the negative trend starts after it.

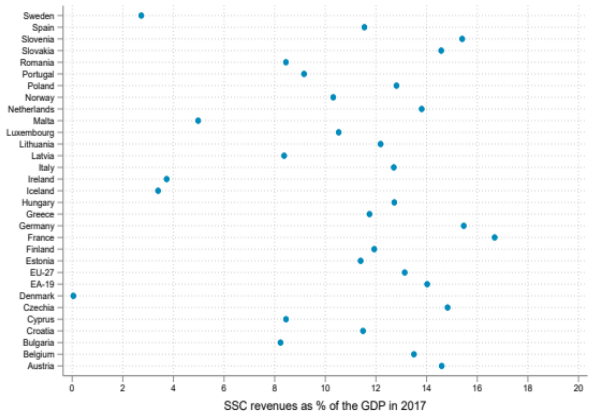
rate planned for 2023. This numbers represent 32.47% of the predicted in- crease in pension expenditure by 2030 (AIReF, 2020).

A common argument against expanding SSC is that they increase labor costs, which erodes the competitiveness of the Spanish economy and could destroy jobs. Further re- search would be needed to understand better the losses implied by raising SSC. However, there are two data points that hint that such losses might not outweigh the benefits. First, there are many OECD countries with higher levels of SSC than Spain (see figure 6a: it is below 12% of GDP for Spain, while in France is higher than 16% and in Germany above 15%. In fact, the average of the EU-27 is around 13%. On the spending side (figure 6b), there are several countries with expenditure levels higher than in Spain. Second, as displayed in table 1, workers who are at the maximum basis work in companies that are much larger than those of workers with lower wages. Large companies might be able to weather the increase in labor costs better than small companies, since they are less likely to be as financially constrained as smaller firms. Nonetheless, additional research is needed to confirm this point.

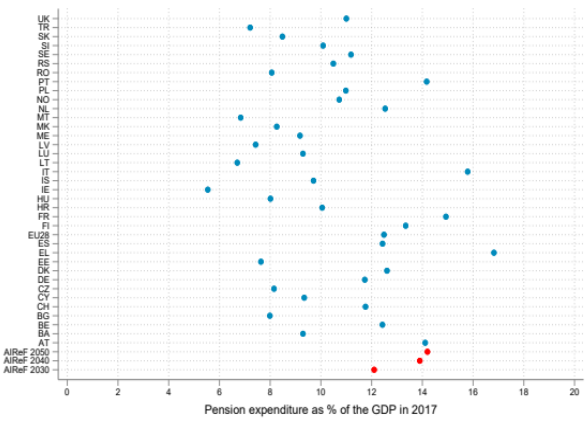
Moreover, the implications of continuing with the reform agenda that reduces pension expenditure are also daunting. One of the consequences is that the purchasing power of pensioners will drop. In other words, an impoverishment of retired people. Furthermore, this can also have adverse macroeconomics effects, because retired people will be able to consume less, with the accompanying negative effect on GDP. In addition, the policy changes implemented in 2011 and 2013 also increase gender inequality. The existence of a more direct bridge between pensions and labour market trajectories has the risk of reproducing the labour market inequalities later in life, after retirement (Vara, 2013). Women's working and earnings trajectories tend to be more interrupted, specially when both a children arrives to the family or there is a relative that needs to be taken care of (Kleven et al., 2019; de Quinto et al., 2021).

Figure 6. Pension Expenditure and Social Security Revenue as % of the GDP

(a) SSC Revenues Across EU in 2017



(b) Pension Expenditures Across EU in 2017



Note: The blue dots in the figures illustrate the percentage of GDP that pension expenditures (panel (a)) and SSC revenues (panel (b)) represented in 2017 for OECD countries. The red dots are the predicted pension expenditure levels for Spain in 2030, 2040 and 2050, based on the predictions in AIReF (2020).
Source: Eurostat.

While the estimates we provide in the paper only imply 32.47% of the expected increase in pension expenditure during this decade, there are other sources of revenue available. For instance, in the regularization of immigrants that took place in Spain in 2005, Elias et al. (2022) es- timate that SSC increased by 3,882 euros per immigrant that benefited from the amnesty. Assuming the effect per capita will be similar, and considering that around 430,000 immi- grants who cannot work in the formal sector lived in Spain in 2019 (Fanjul and Gonz´alez- Iniesta, 2022), we estimate that SSC can increase by around 1700 million euros. Therefore, the approval of an amnesty granting work permits to undocumented immigrants could increase social security funds by an additional 0.1366%.

To sum up, the combination of uncapping SSC, increasing the contribution rate by 0.6 pp, and the regularization of immigrants represent around 44% of the revenue needed by 2030. While this might still be insufficient given the demographic trends, it is an economic policy option worth considering to avoid the impoverishment of pensioners.

Finally, we want to add a last note. The decrease in the wage share, if not reverted, will continue putting pressure on the current funding system for contributive pensions. We think there are two options. The first one is to implement reforms that improve wages in Spain. On the one hand, by improving the bargaining position of workers. On the other hand, by investing to increase productivity. Nevertheless, these reforms are likely to have an effect more in the long-term. Hence, the second option. The decrease in the wage share implies other categories are increasing. Among them: profits, interest payments or rent payments. There is no solid argument why contributory pensions should only be financed with SSC, as is done today and is written in the Pacto de Toledo. Therefore, the taxation of other economic variables, not only wages, could also be considered as a way to guarantee the sustainability of the pension system.

6. Concluding Remarks

We estimate that SSC in Spain can increase by 0.22% of GDP by uncapping them. To obtain this estimate we exploit variation from the years 2018-19, when the maximum SSC basis was increased by 7%. Unlike pension reforms in 2011 and 2013 that decreased pension expenditure, uncapping SSC can help in ensuring pension sustainability by increasing public revenues.

Finally, we discuss the potential additional revenue that can be raised through the MEI and by an immigrant amnesty. We estimate that a combination of these measures together with uncapping can represent 0.53% of GDP, or 44% of the expected increase in pension expenditure by 2030.

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A Appendix: Employment Responses

The increase in the maximum basis implies higher labor costs. This increase in costs could be beared by workers in terms of lower employment if firms decide to end some job relationships. Thus, our method would imply we overestimate the increases in payroll tax collection. In this section we explore if there is evidence that the movement up of the maximum basis in 2019 destroyed jobs in the proximity of the social security cap.

We proceed as follows. We use data to the left of the 2018 maximum basis to construct a counterfactual of what it would have been absent the cap. We compare the actual data with the counterfactual at the 2018 maximum basis and we measure the number of workers bunching at the maximum basis. The bunchers will appear further up in the wage distribution after the maximum basis increases in 2019. Then, we compare this number with the actual data for 2019. If the former measurement is larger than the latter, that implies there was employment destruction. To construct the counterfactual, we run the following specification:[15]

$$c_k = \beta w_k + \gamma_{2018} + v_k \qquad (3)$$

where c_k is the share of workers in wage bin k, w_k is the wage bin k and γ_{2018} is a fixedeffect for the maximum basis in 2018.

The estimates are the predicted values from equation 3 omitting the contribution of the γ_{2018} fixed effect:

$$\hat{c}_k = \hat{\beta} w_k \qquad (4)$$

To quantify the number of workers bunching at the 2018 maximum basis we take the difference between the observed and counterfactual bin counts. Specifically, we measure the bunching mass (B) as follows:

$$\hat{B} = c_k - \hat{c}_k \qquad (5)$$

The last step consists in subtracting from the bunching mass of workers the workers that are located between the 2018 and the 2019 maximum basis:

$$\textbf{Missing Workers After Reallocation} = \hat{B} - \sum_{k>2018\ MB}^{2019\ MB} c_k \qquad (6)$$

where MB refers to the maximum basis.

The results are shown in figure A.I and table A.I. Panel A in figure A.I displays the results when the counterfactual is constructed using a linear polynomial. The green and the blue dots show the actual wage distribution near the maximum basis for 2018 and 2019, respectively.

[15] We also show results for a quadratic and a cubic specification.

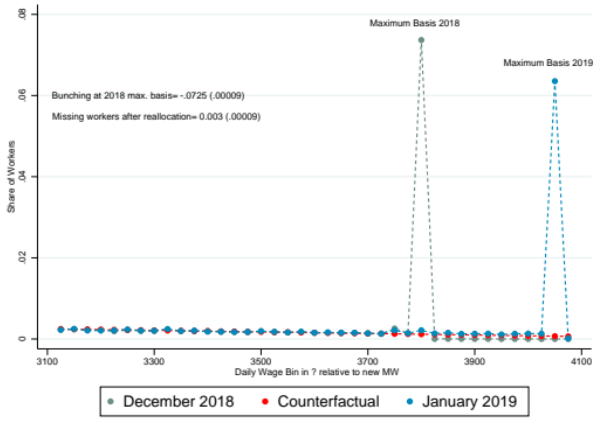
The red dots are the counterfactual estimates. As can be seen, the counterfactual fits well the observed data for 2019. We estimate B to be around 7.21 percentage points (pp), whereas missing workers after reallocation (MWAR) is 0.34 pp. Note that it is positive and significant and that if there had been employment destruction in the upper part of the wage distribution we would have measured a negative effect.

Panels B and C in figure A.I repeat the exercise but using a quadratic and a cubic polynomial. The results are both visually and numerically very similar to the estimates for the linear polynomial case we just discussed. In table A.I we report additional results for each type of polynomial and changing the first wage bin we use to construct the counterfactual. The results are all very similar.

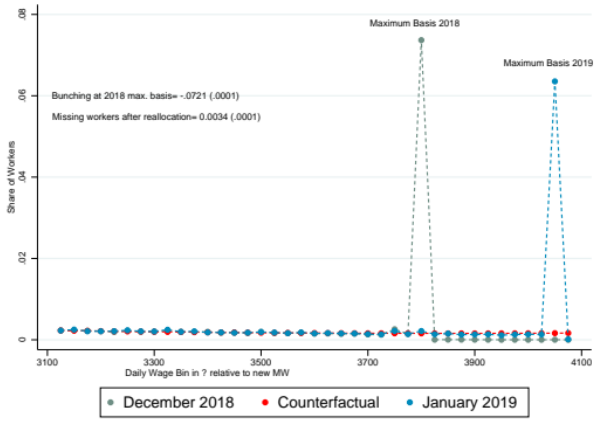
We interpret the estimates as evidence that the increase in the maximum basis did not imply the destruction of jobs in the affected part of the wage distribution. Nonetheless, we cannot discard employment destruction affected workers in other parts of the wage distribution.

Figure A.1: Actual and Counterfactual Distributions Near Maximum Basis

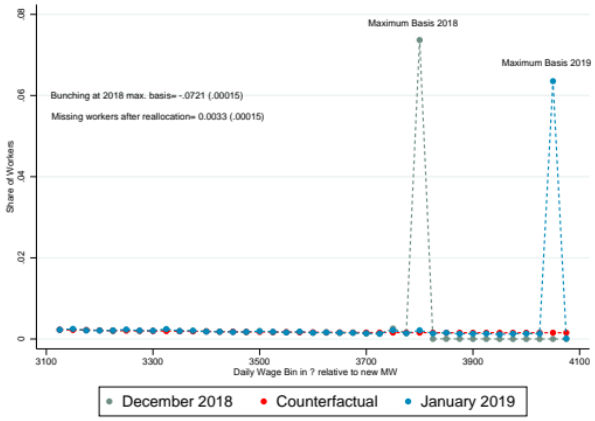
(a) Linear Polynomial



(b) Quadratic Polynomial



(c) Cubic Polynomial



Note: This figure presents the results from an exercise studying the effects of increasing the maximum basis on employment on that part of the distribution. See section A in the Appendix for details. Panel (a), (b) and (c) present results from the same exercise but when using a linear, quadratic and cubic polynomial to construct the counterfactual respectively. The green dots and the green dashed line show the wage distribution for December 2018. The blue dots and the blue dashed line are for January 2019. The red dots represent the estimated counterfactual distribution.
Source: Own elaboration.

Table A.I. Employment Reallocation at the Top

Lower Bound	Linear (1)	Quadratic (2)	Cubic (3)
2500	0.0034	0.0034	0.0033
	(0.0001)	(0.0001)	(0.00015)
2750	0.0034	0.0034	0.0034
	(0.00011)	(0.00011)	(0.00014)
3000	0.0034	0.0034	0.0035
	(0.00014)	(0.00014)	(0.00021)
3250	0.0035	0.0035	0.0037
	(0.00021)	(0.00021)	(0.0003)
3500	0.0038	0.0038	0.0037
	(0.00032)	(0.00032)	(0.00055)

Notes: This table presents the point estimates and standard errors (in parentheses) that measure whether the increase in the ceiling in 2019 destroyed employment near the maximum basis. The equation is specification 6. Column (1) reports the results obtained from estimating the counterfactual with a linear polynomial, column (2) when using a quadratic polynomial and column (3) when using a cubic polynomial.
Source: Own elaboration.