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Efficiency vs. Equity: Does This Trade-Off Hold for Minimum Wage Policy?[1]

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lower employment probabilities and/or higher unemployment incidence.

The remainder of this article provides a non-technical summary of Galán and Puente (2015), who estimated the effects of an important minimum wage increase that occurred in Spain in the late 2000s. These estimations are then used to provide an assessment of recent and projected increases, both in terms of efficiency and equity. The bottom line is: minimum wage increases actually could do harm on both fronts.

INTRODUCTION

Minimum wage policy is often seen as a tool to ensure lower income inequality. From a theoretical point of view, raising minimum wage has costs in the form of employment losses and unemployment, as labour supply for those jobs with equilibrium wages below the minimum cannot find enough labour demand. However, there is also a theory supporting minimum wages. Those workers losing their low-wage jobs could find it profitable to increase their human capital, in order to find a new, better job that complies with the new minimum level, and hence increases the productivity of the economy. If labour demand takes the form of very few agents with some monopsony power, then setting a higher minimum wage could also partially offset the market power of those few employers.

Which effect dominates is therefore an empirical question. Applied literature has approached this problem from two different angles. One stream uses some sort of macro data, and estimates the effect on aggregate[2] employment after an increase in minimum wages. This tends to find little or no effects on employment trends after the increase in minimum wage[3], usually concentrated on young people. The problem with this approach is that it is difficult to disentangle the true effects of minimum wages from the fact that very few workers are usually affected because of the low level of minimum wages. Not surprisingly, the results are more negative among those groups with a higher share of affected people, i.e., the young.

The other approach uses individual micro data to assess individual employment prospects after an increase in minimum wage. Here, the share of affected people is not an issue, since the focus is on individuals. Findings in this literature are much more negative[4]: minimum wage increases are often followed by lower employment prospects among those workers affected by the new minimum, in terms of

DATA AND METHODOLOGY

The Spanish government made a substantial increase (11.4%) in the minimum wage[5] in January 2005. There were further, smaller increases in the subsequent years up until 2010, all of which were higher than inflation. By 2010, the minimum wage cumulative increase reached 37.5% (more than 18% in real terms), rising from 537.3 euros/month in 2004, to 738.9 euros/month in 2010. This important increase within a relatively short time span makes it possible to analyse the effects of minimum wage increases on employment.

Data used for such a task are individual labour histories, available in Spain thanks to Social Security[6]. These micro data make it possible to focus on particular workers, affected by the minimum wage increase, and follow their working careers after the increase to properly estimate its potential effects on employment prospects.

The methodology used to estimate these effects is based on the comparison of workers affected by the increase in the minimum wage (called "affected group"), with other, similar workers, not affected by the increase (called "control group"). If employment prospects in the affected group are worse than those observed in the control group, then we can say that minimum wages have a negative effect. Workers in the affected group are defined as those whose current real wage[7] is below the real minimum wage twelve months later. It is precisely for these workers that employers have to make the choice of either raising their wages to comply with the new minimum, or firing them.

Table 1 shows the observed probability of losing employment status, depending on whether the individ-

[1] The views expressed here are those of the author, and do not necessarily coincide with those of Banco de España or the Eurosystem.

[2] This aggregation could be at the level of states, counties, or even firms. But these studies always share an interest in aggregate employment, without looking at each individual's labour market performance.

[3] See for example Card and Krueger (1994), Dube et al. (2010), or Dolado et al. (1996).

[4] See, for example, Neumark et al. (2004) or Galán and Puente (2015).

[5] The minimum wage in Spain has been common for all workers, irrespective of age, since 1998.

[6] In particular, we have complete employment histories for each worker since 1980, with monthly information about wages, days worked, and personal and job characteristics, for a 4% sample of all workers.

[7] Both observed and minimum wages are deflated by standard CPI.

Table 1

Comparison of Employment Loss Probability Between Affected and Others

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Affected	-	-	-	-	16.7%	16.6%	15.3%	18.2%	23.7%
Others	8.6%	9.1%	8.6%	8.6%	8.6%	8.5%	8.7%	11.0%	15.1%

Source: Authors' calculations (2018).

ual is affected or not. As it can be seen, people in the affected group were far more prone to lose their job than others. While this is illuminating, it is not enough to infer any causal effects, because both groups could differ in many ways apart from whether they were affected or not.

Consequently, these affected workers are compared to two different groups: firstly, to workers with wages that are slightly above the new minimum, hence not affected by the increase while at the same time earning a similar wage; and secondly, workers earning the same wage, but in years when real minimum wages actually decreased, i.e., between 2000 and 2004. While the actual estimation is a little more complex[8], these two groups together loosely define the control group mentioned above.

ESTIMATION RESULTS

Table 2 summarises the main results of the estimation, for several age and gender groups.

As it can be seen, the increase in minimum wages leads to a significant deterioration in the labour market performance of affected workers, except for those between 25-32 years of age. Indeed, the effect is most harmful for elderly workers, which seems to be in conflict with other studies based on aggregate data. But this conflict is easy to reconcile: individual elderly workers who happen to earn a wage lower than the new minimum level are more adversely affected than their younger counterparts. However, since there are far more workers earning low wages among young people, the aggregate effect seems to be higher for the young.

Why are elderly workers more intensively affected? The reason is fairly intuitive: the firing probability is related to the wage increase needed to comply with the new minimum, but also to the typical real wage increase observed for a particular gender and age group, in normal years when minimum wages are not increasing. If the minimum wage raises by X, but the employer would have increased the wage of a particular worker by more than this amount, then the expected effect should be zero. This is what is happening for those middle-aged workers. They are in the steep part of their life-cycle profile of wages, with strong productivity increases each year, as they accumulate experience. On the other hand, the elderly typically enjoy much lower increases, which are not enough to compensate for the rise in the minimum wage, and hence they are more prone to be fired.

Finally, it should be noted that the approach used here only takes into account job losses after the introduction of a higher minimum wage. The possible effects on job creation are therefore absent. This is especially important for those groups with typical high wage growth for the following reason: let's suppose that most 30 year-old workers have the usual wage improvements above the minimum wage increase, so most of them actually keep their jobs one year later. Does it mean minimum wages do not have any negative effects for this particular age group? Not necessarily, as workers who were 29 years old last year, and hence have less experience and a typical lower wage, could find it difficult to find a job when they are 30, with a higher minimum wage in force. The implication is that our estimations of job destruction are downward biased for those fast-growth wage groups, and they are probably closer to the true total effect for people with stable wages, i.e., elderly people.

[8] In particular, we estimate a logit model for the probability of not being employed in t+12. The main explanatory variable is the gap between the current real wage and the new minimum wage twelve months later (only positive for affected people, and zero otherwise), interacted with age group dummies. Other controls included are wage, interacted also with age, nationality, duration of contract, tenure in the firm, family situation, and year and month dummies. The presence of all these controls allows us to interpret the estimated coefficient for the gap as the effect of a minimum wage increase on the individual probability of keeping or losing employment status.

Table 2

Estimation Results

Age group\gender	All	Men	Women
16-24	7.6*	9.3*	7.3*
25-32	2.6	1.9	4.0
33-45	5.1*	2.0	11.9*
More than 45	14.2*	9.2*	17.9*

Note: Effects are measured as: increase in percentage points on the probability of losing employment of affected workers, after an increase in minimum wage of 100 EUR. An * denotes statistical significance at 1%.
Source: Author's calculations (2018).

RECENT INCREASE IN MINIMUM WAGE IN SPAIN: PREDICTED EFFECTS

After the above-mentioned increases, the real minimum wage remained stable during the first part of the 2010s. But in recent years, the minimum wage returned to growth (8% in 2017 and 4% in 2018). Moreover, the public debate is strongly biased towards further increases. Indeed, it has already materialised in a Framework Wage Agreement between main social agents, which suggests a minimum bargained wage of 14,000 euros/year, and Spain's new government stated their intention to enforce it by setting a minimum legal wage very close to this figure. This would imply a substantial increase (of over 35%) compared to the 2018 level.

The estimations presented in the previous section make it possible to infer the predicted effects of these realized and foreseen increases on employment developments. In this respect, it is worth mentioning a common mistake, usually present in other analyses of minimum wage effects. This error involves estimating a certain elasticity of employment to minimum wage, and using it to extrapolate available estimations to further increases.

Table 3

Predicted Employment Effects in Different Scenarios

Age	Scenario 1: Min wage = 825.5 €			Scenario 2: Min wage = 933.3 €			Scenario 3: Min wage = 1108.3 €		
	Share affected	Job losses, total	Job losses, affected	Share affected	Job losses, total	Job losses, affected	Share affected	Job losses, total	Job losses, affected
[16-25)	32.69%	1.64%	5.01%	37.45%	4.52%	12.07%	49.01%	10.27%	20.96%
[25-33)	7.35%	0.13%	1.71%	9.91%	0.37%	3.77%	18.33%	0.99%	5.41%
[33-46)	1.16%	0.03%	2.55%	2.67%	0.13%	4.85%	7.88%	0.57%	7.21%
[46-70)	0.93%	0.07%	7.03%	2.09%	0.29%	13.82%	5.79%	1.21%	20.89%
[16-70)	3.23%	0.12%	3.64%	4.90%	0.39%	7.98%	10.28%	1.24%	12.05%

Source: Author's calculation (2018).

This is not a good approach because the number of affected people is highly non-linear, which makes using elasticity misleading. The intuition is easy to explain by means of an example: Suppose the minimum wage is set to zero, and then a one euro/month increase takes place. Probably, the number of affected workers would be close to zero, and so it is the estimated elasticity, even using micro data. Does it mean we can raise it without boundary without fearing any employment effects? The answer is clearly not, as further increases will start to affect more and more people, taking taller parts of the wage distribution below the minimum. So, the correct approach is to apply the previous estimations to each worker present in the current wage distribution, and estimate his probability of losing his job as a consequence of the new minimum. Then, we can obtain an aggregate effect by adding up all these individual effects.

This is what is done in this section. In particular, we take the wage distribution of 2016 (the last year available in our sample), and compute individual predicted probabilities of losing the job, based on individual characteristics, and on the distance between the current individual wage and the new minimum. We make three different exercises, each assuming a different new minimum: Scenario 1 assumes a new minimum of 825.5 euros/month, which is the level in force in 2017, after the first 8% increase. Scenario 2 uses an intermediate figure (933.3 euros/month). Finally, scenario 3 is close to the suggested minimum bargained wage (1108.3 euros/month).

Table 3 presents the results of the exercise. For each scenario, three columns are presented. The first one shows the share of workers affected (i.e., with current wages below) by the new minimum. The second one estimates implied total employment loss, as a fraction of all workers. Finally, the third one also reports job losses, but as a fraction of affected people only.

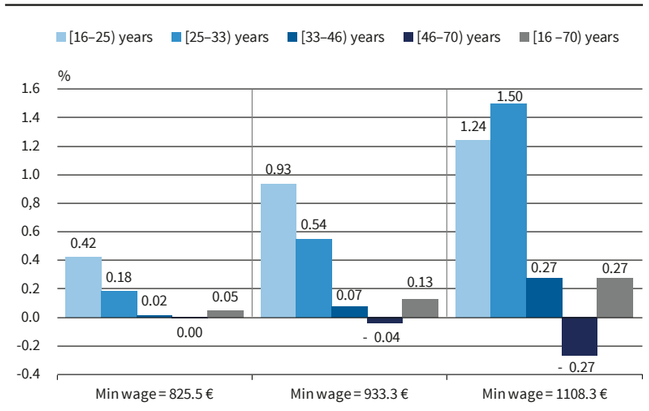
The share of total affected workers ranges from 3.2% (scenario 1) to 10.3% (scenario 3). But there are important differences among age groups. For all the three scenarios, young workers are by far the most affected group, reaching almost 50% of all young workers in the third scenario.

In terms of employment losses, estimates vary from a small 0.1% in the first scenario, to ten times higher in the third one (1.2%). This illustrates the danger of extrapolating elasticities, as the effect in the last scenario is disproportionately high in comparison with the associated minimum wage increase. Indeed, if we have instead extrapolated the effect of scenario 1 to the increase in the third one, we would have obtained approximately half of the effect.

These employment effects are also unequal among age groups. Young workers, being the most affected, also concentrate most of the employment losses, with figures around ten times higher than the aggregate. However, if we divide job losses only over affected workers (in order to better capture average effects on individual job loss probabilities), we find that

Figure 1

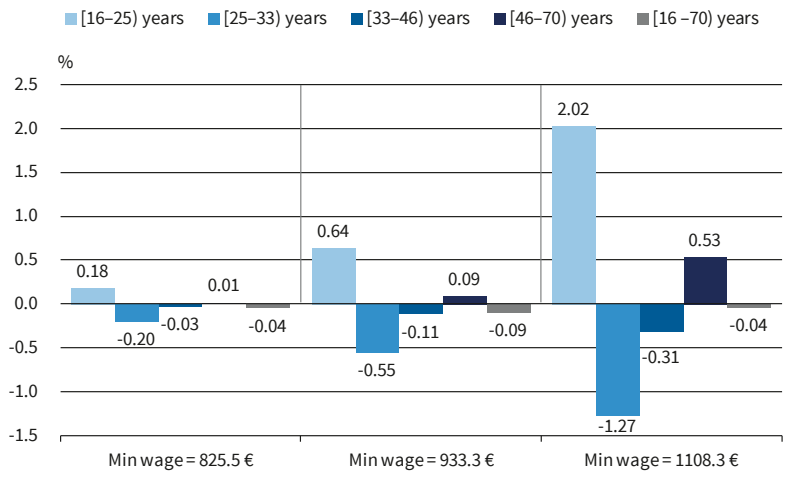
Wage Bill Changes for Different Age Groups and Minimum Wages



Source: Author's calculations (2018). © ifo Institute

Figure 2

Changes in the GINI Coefficient for Different Age Groups and Minimum Wages



Source: Author's calculations (2018).

elders are as affected as the young. The different number of affected people is behind this difference.

We estimate that some workers lose their job, but other do not. Consequently, it is interesting to see whether the total employment bill actually decreases or not in each of the scenarios. This is done in Figure 1.

The result is that the total wage bill actually increases for all age groups but the oldest one. However, this increase is quite small in comparison with the amount of the increase in the minimum wage necessary to achieve it. Moreover, the wage bill actually decreases for the last age group, precisely the group least affected by the bias mentioned before. All these results illustrate the reduced role of minimum wages as an income policy.

Finally, we have estimated the effect for each particular individual. This allows us to obtain not only aggregate effects, but also to analyse changes in the whole income distribution. This is useful when we try to assess whether minimum wages are a good inequality tool or not. In this respect, there are two competing forces. On one hand, workers losing their job are worse off. But on the other hand, those managing to keep working actually earn a higher wage. Therefore, the effect on inequality is uncertain. We present results in this respect using the variation in the Gini coefficient resulting from each of the scenarios described above. The results are shown in Figure 2.

As it can be seen, the total Gini index presents a negligible variation, suggesting that the two previous effects compensate each other. However, for both young and elders, the increase in the Gini index is quite apparent. Again, elders are the least affected group by the previous bias. Hence, these results point to a reduced, or even adverse, effect of minimum wages on inequality.

CONCLUSIONS

Macroeconomic effects of minimum wages are uncertain in the economic literature, mainly due to the small number of affected people. However, microeconomic evidence is much clearer, pointing to significant adverse effects of minimum wages on employment, especially among low skilled people. We presented estimations of this effect, finding it more intense among elder affected workers. We also applied the estimations to current and future minimum wage increases. Our finding is that the more intense the increase is the more employment destruction it implies, in a more than proportional way. Finally, our results also point to a reduced, or even adverse effect of minimum wages as an income or inequality policy tool. Hence, the trade-off between efficiency and equity seems to be not present in the case of minimum wages: They actually decrease efficiency (employment) without improving equality.

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