

# The Impact of minimum wage on low wage formal employment \*

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July 2020

## Abstract

In this paper, I adapt the difference-in-differences design developed by Cengiz et al. (2019) to estimate the impact of a minimum wage increase in Mexico on formal employment by exploiting regional heterogeneity in the implementation of this policy. In particular, I contrast a 100% minimum wage increase in the municipalities closest to the border with the United States with a 16% increase in the rest of the country, both taking place in January 2019. The main finding of this paper is that formal employment in the the localities around the northern border is 0.6% lower due to the minimum wage increase, which represents an elasticity of employment with respect to minimum wage of  $-0.007$ . At the same time, the estimated effect is a little higher in manufacturing, where employers face more rigidities to adjust wages and prices due to more international competition.

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\* *Disclaimer*: This paper uses confidential data from the Mexican Social Security Institute (IMSS) accessed through Banco de Mexico's EconLab. The views and conclusions presented herein are exclusively the responsibility of the author and do not necessarily reflect those of Banco de Mexico

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# 1 Introduction

In this paper, I adapt the difference-in-differences design developed by Cengiz et al. (2019) to estimate the impact of a very large minimum wage increase on formal employment in Mexico. After three years of a unified minimum wage policy at the national level, the Mexican government decided to divide the country, starting in January 2019, into two regions based on different minimum wages. In practice, this policy resulted in a minimum wage increase of 100% in the municipalities around the northern border and 16% in the rest of the country. The main advantage of the approach adopted in this paper is that the estimation of the impact on employment of affected formal workers uses the information from the entire distribution of salaries and subsequently focus on changes at the bottom of this distribution. Practically speaking, I implement an event study analysis that exploits the differentiated wage increase policy mentioned above to identify the effect of the minimum wage on the frequency distribution of wages. I use daily wage data from the Mexican Social Security Institute (IMSS) administrative employer-employee matched administrative-records to estimate the effect of the minimum wage by wage bins. The main finding of this paper is that formal employment in the municipalities around the northern border is 0.6% lower due to the minimum wage increase.

This paper relates to the extensive and much-disputed literature on the effects of minimum wage on employment exploiting regional variation in the implementation of this policy (Allegretto et al., 2017; Neumark, Wascher, Wascher, et al., 2008; Card and Krueger, 2015; Stigler, 1946). In particular, this paper directly compares to Cengiz et al. (2019) and Meer and West (2016), who examine the relationship between aggregate employment and minimum wage changes. Our main contribution is to adapt their approach to estimating the effect of minimum wage on formal jobs in Mexico, a mid-income economy, focusing on those workers who are directly affected in two ways. First, these are the workers who are around the levels of the new minimum wage. Second, the compliance of the minimum wage legislation of these workers is almost complete since formal sector firms that employ them are exposed to be inspected by IMSS since they already registered these workers at the social security system.

Most of the literature on the effects of minimum wage on employment focuses on estimating this impact in the United States and Europe with few references that address the emerging countries' case <sup>1</sup>. In the Mexican

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<sup>1</sup>There are several materials that review the empirical minimum wage literature. See

case, the oldest example is Bell (1997), who uses data from the Industrial Survey (1984-90) and the National Employment Survey (1988) to find that the minimum wage has no statistically significant effect on employment. More recently, there has been a burgeoning list of references that exploits the variability of minimum wage across three regions before they were all unified at the national level (Bouchot Viveros, 2018; Campos, Esquivel, and Santillán, 2017). The main difference between these articles and my paper is that the effect they estimate is based on a small minimum wage increase, while this paper studies an increase of about 80% of the minimum wage. Moreover, they use household data, while I use a census of all formal workers.

## 2 Minimum Wage in Mexico

The Minimum Wage National Commission (*CONASAMI* from its acronym in Spanish) sets the minimum wages in Mexico according to the Constitution. The members of *CONASAMI* are representatives of workers, employers, and government. All wage and salary workers must earn a salary above the minimum wage in force in the region where they work without exceptions. The regular practice of *CONASAMI* is to adjust the minimum wage at least once a year using the inflation rate as one of the criteria to determine the size of the increase.

Until 2012, the entire Mexican territory was divided into three regions according to the level of the minimum wage before *CONASAMI* progressively introduced three significant modifications in the minimum wage setting. First, all three areas were consolidated into two in 2012, and then into one in 2015. The unification of all three regions resulted in minimum wage increases between 2.7% and 2.9%. Second, *CONASAMI* introduced the Independent Amount of Recovery (MIR its acronym in Spanish) in 2017, which was a tool to decouple wages from minimum wage adjustments. In other words, since the MIR is expressed in Mexican pesos opposite to percentage change, its introduction was intended to avoid spillover effects of minimum wage increases to other wages.

After three years in which there was only one minimum wage level for the whole country, *CONASAMI* again divided the country into two minimum wage regions in 2019. In practice, this division implied that the minimum wage was doubled in all the municipalities around the border with the United States (Northern Border Free Zone) as part of a set of provisions to promote

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Neumark (2018) and Belman and Wolfson (2014) and the references therein.

higher wages in this region, while the increase for the rest of the country was 16%. The other elements of the focalized policy in the Northern Border Free Zone (*ZLFN* for the acronym in Spanish) were a reduction of VAT and income tax rates. Thus, our findings pick up both the effects of the increase of minimum wage and the decrease in taxes.

In general, the minimum wage in Mexico is one of the lowest in between comparable countries. For instance, Mexico is in the first quintile of the minimum wage distribution of OECD countries. Also, it is one of the lowest in between countries that have a similar GDP per capita. One of the rationalities behind the new minimum wage policy made public in 2018 is precisely to recover its purchasing power.

### 3 Methodology

This paper follows a similar approach as Cengiz et al. (2019) to infer the effect of the minimum wage from the employment changes at different places of the wage distribution. In this approach, a counterfactual wage distribution is identified by exploiting area-level variation in the minimum wage and using a difference-in-differences event-study design. In particular, the paper examines employment changes within a window of 9 quarters around the prominent minimum wage event described above. I capture here only the short-run effects. The identification assumption is that shocks that affected the formal employment at the *ZLFN* within each salary band, independent of the one that affected employment in all the municipalities at the same time, was the increase of minimum wage and tax exemptions as consequences of the *ZLFN* formation.

To estimate the impact of the regionally differentiated minimum increase, I divided the salary distribution at the municipal level into MXN 25 bands in the interval that begins in the old minimum wage and ends with the top code ( $25 \times UMA$ ).<sup>2</sup> Then I estimate the average employment level in each wage band for each month during the study period. I control for unobservables by introducing two types of fixed effects. First, I add time fixed effects, which controls for shocks that affect employment in all municipalities at the same time. Second, I use wage-band fixed effects at the municipal level to control for heterogeneity between municipalities.

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<sup>2</sup>The Unit of Measurement and Updating (*Unidad de Medida y Actualizacion* in Spanish) is a reference amount to set obligations, taxes, and fees. In 2019, the value of the *UMA* was *MXN*84.49 for obligations set at the daily basis.

I implement this methodology by running the regression:

$$\frac{E_{mjt}}{N_{mt}} = \sum_{l=-5}^4 \sum_{k=-100}^{350} \alpha_{kt} I_{mjt}^k + \text{frontera}_m + \rho_t + \epsilon_{mjt} \quad (1)$$

where  $E_{mjt}$  is formal employment in the wage band  $j$  located in municipality  $m$  at period  $t$ , and  $N_{mt}$  is the population in the municipality  $m$  in period  $t$ . The variables  $I_{mjt}^k$  equals 1 if the minimum wage was raised  $l$  quarters from date  $t$ , for the *MXN5* wage bin  $j$  that fall between  $k - 25$  and  $k$  Mexican pesos relative to the new minimum wage in the ZLFN and for  $m$  that is located in the ZLFN. Moreover, *frontera* is a dummy variable that distinguishes the municipalities that belong to the ZLFN, and  $\rho_t$  is a time fixed effect. The coefficient  $\alpha_{kt}$  measures the difference of employment count in the wage band  $k$  between the municipalities in the ZLFN and the rest of the country in the lag quarter  $l$  after controlling for municipal heterogeneity. I cluster the standard errors by states to account for the possibility that employment changes at different parts of the wage distribution may be correlated within the state.

As mentioned by Cengiz et al. (2019), there are two advantages of decomposing the aggregate employment changes by wage bins in our approach. First, such a decomposition allows me to focus on employment changes in the neighborhood around the new minimum wage. In other words, I focus only on the part of the wage distribution, where I expect the policy to have an effect. Second, the localized focus around the minimum wage often improves the precision of estimates by filtering out random shocks to jobs in the upper part of the wage distribution.

I use the estimated  $\alpha_{kt}$  from equation (1) to determine the change in employment throughout the wage distribution in response to the creation of the ZLFN. I calculate the difference in the number of jobs (per capita) paying wages within the wage band  $k$  between the last quarter of 2018 and the corresponding quarter  $l$  using the formula  $\alpha_{k,l} - \alpha_{k,l_0}$ , where  $l_0$  corresponds to the last quarter of 2018. I normalize the employment changes by the total pretreatment employment, by dividing  $\alpha_{k,t} - \alpha_{k,l_0}$  by  $(\frac{\bar{E}}{N}_{IV2018})$ . Thus, I can calculate the difference in the number of jobs (per pretreatment employment) in the wage band  $k$  with the formula

$$\Delta e_{k,l} = \frac{\alpha_{k,l} - \alpha_{k,l_0}}{(\frac{\bar{E}}{N}_{IV2018})}. \quad (2)$$

Similarly, I calculate the change in the number of jobs (per pretreatment employment level) paying below the new minimum wage between event date

0 and  $\tau$  can be calculated as  $\Delta a = \sum_{k=-100}^0 \Delta e_{k,l}$ . Finally, the change in the number of jobs (per pretreatment employment level) paying between the new minimum wage and the new minimum wage plus *MXN*350 is  $\Delta b = \sum_{k=25}^{350} \Delta e_{k,l}$ . In the end, the percentage change in total employment due to the increase of the ZLFN minimum wage relative to the rest of the country is  $\Delta e = \Delta a + \Delta b$ .  $\Delta e$  represents the estimate for the percentage change in total employment due to the minimum wage increase. To be clear,  $\Delta e$  is a difference-in-differences estimate, in the framework of "event-based bunching, as shown by Cengiz et al. (2019). In other words, I am using an event-based difference-in-differences design and estimating the excess and missing jobs locally around the bunching in the distribution at the minimum wage. To obtain the employment-elasticity with respect to the minimum wage, I use the following formula

$$\frac{\% \Delta Total Employment}{\% \Delta MW} = \frac{\Delta e}{\% \Delta MW} \quad (3)$$

where  $\% \Delta MW$  is the difference in MW increase across regions.

## 4 Data

Our data consists of a matched employer-employee dataset that comes from the administrative records of IMSS. This dataset covers all private employer businesses in Mexico that report payroll taxes to the IMSS. In fact, this data is a census of all workers that are reported by these employers. The sample period of this study goes from January 2016 to December 2019, so I only focus on the short-run, but as a timely exercise, effect. At the level of individual workers, the dataset has information on age, gender, industry, and location of the employer at the municipal level. The number of workers covered by the IMSS data goes from 19 million persons to 20.4 million persons during the sample period. The ZLFN and the rest of the country comprise 10.3% and 89.7% of the total jobs enrolled at IMSS in November 2018, as can be seen in Table 1.

Table 1 shows some descriptive statistics for the whole country and by minimum wage zones. Both zones are similar in terms of female share and age of workers. Given the proximity of the ZLFN to the border with the United States, it should be no surprise that manufacturing has a considerable share of formal workers in this region. On the contrary, the rest of the country's formal employment is more uniformly distributed between commerce, personal services, and manufacturing. In our estimation, heterogeneity is

controlled for by introducing fixed effects by wage bin and municipality in the regression. In any case, I also check the robustness of my results by estimating the impact with manufacturing workers only.

Another observable difference between both regions is that employers in the ZLFN are slightly smaller than in the rest of the country. Furthermore, the workers directly affected by the new minimum wage in November 2018 were 15.4% of total employment in the whole country. As we expected, the fraction of workers affected by the new minimum wage was much larger in the ZLFN than in the rest of the country. In particular, 29% of all formal workers earn wages lower than the new minimum wage of this zone in November 2018, while the fraction of workers directly affected in the rest of the country in the same month was 14%.

We also observe the daily contribution wage (SBC from its acronym in Spanish), which includes all payments made in cash as wages, including bonuses, food, room, commissions, and benefits in kind for almost all workers. The distribution of SBC is used to create the wage bins. No worker is reported earning less than the minimum wage. Employers do not report wage information for 0.8% of all formal workers, so I exclude them all. Given the short sample period in our sample, I did not deflate wages to avoid adding trends within a year in real wages due to price index changes.

I assign each formal worker to an MXN 5 wage bin at the municipal level according to their SBC running from the minimum wage in force during the corresponding month to MXN 1440. All workers whose SBC surpasses this level are assigned to the top category. During the period of interest, there were three minimum wage levels in two different regimes. First, there was only one minimum wage regime for the whole country between April 2017 and December 2018. In the beginning, the daily minimum wage was MXN 80.04 before it was raised to MXN 88.36 in December 2017. A possible concern with our identifying strategy is that this raise may have an impact. However, if this is the case, it will get picked up by the time fixed effects. Second, there was a new minimum wage regime in which the country was divided into two regions. The effect of this new regime is what I am estimating in this paper. For each of these 288 wage bins, I collapse the data into monthly, municipal-level employment counts  $E_{mjt}$ . One advantage of using the IMSS data is that these employment counts are not subject to sampling error since this data contains information of all formal workers in the private sector in Mexico. The final sample size is 268,213 wage bins.

I use two sources of information for population data at the municipal level. First, I use the population levels from the 2005 and 2010 Censuses. The second source is the 2015 Intercensal Survey, which was specifically

designed to obtain an estimate of the population levels by gender and age at the national, state, and municipal levels. We refer to all these sources of data as census population data. Since this information corresponds to a point in time, we estimated the municipal-monthly-level population,  $N_{mt}$ , by linearly interpolating the census data using the month as the running variable.

As Cengiz et al. (2019) mention in their paper, one source of concern when using MXN 5 wage bins is that some of these bins may be sparse with very few or no workers. This feature should not be a problem for this type of data since the absence of workers in any wage bin is not due to sampling error. On the contrary, zero-worker cells convey essential information that is exploited by our method to estimate the effect of the minimum wage. Moreover, my employment estimate is based on the sum of employment changes in 108 cells covering an MXN 460 range [current MW,  $3 \times$  MW].

Another potential problem with the data is that employers might misreport wages, which may bias our estimates. Since the information to construct this data set is based on what employers report to pay their social security taxes, the reported wages may contain some measurement error. For this reason, some workers earning above the minimum wage will appear to receive an SBC below it, which could attenuate the estimate for  $\Delta b$ . However, this does not affect the consistency of the estimate for  $\Delta e$  as long as the minimum wage only affects reported wages below MXN 540.

## 5 Results

I begin my analysis by estimating the effect of the minimum wage on the frequency distribution of *SBC*. Figure 1 shows the results of our baseline specification (see equation 1). I report employment changes from the last quarter of 2018 to the last quarter of 2019 for each wage bin ( $k$ ). All employment changes are normalized to pre-treatment total employment in the municipality.

We can note several points from Figure 1. First, there is an evident and significant drop in the number of jobs below the new minimum wage of the ZLFN, amounting to 7% of the total pre-treatment employment in this area. Second, there is a statistically significant increase in employment in the wage bins just above the new ZLFN minimum wage. The excess jobs between the new minimum at the ZLFN and above represent 6.4% of the total pre-treatment employment. Third, the employment changes in the upper-tail wage bins are all small in size and statistically insignificant.



Fourth, the net effect of the differential increase in the minimum wage is a reduction of employment amounting to 0.6% of the total pre-treatment level. Finally, the drop in employment just below the new ZLFN minimum wage, the smaller increase just above this level, and the lack of employment change in the upper tail are expected if employers comply with the law adjusting wages and employment, especially for workers enrolled in the social security system.

I estimate the employment change by adding  $(\Delta b)$  and  $\Delta a$ . I divide this change by the jobs below the new minimum wage in the ZLFN ( $\bar{b}_{-1} = 39.4\%$ ) to obtain a change in the affected employment of  $-1.5\%$ , which is statistically significant at the 5% confidence level. Given the differential minimum wage increase between both regions was 84%, the employment elasticity with respect to the minimum wage is  $-0.007$ , which is negative but at the lower end of the estimates in the literature (Belman and Wolfson, 2014).

Figure 2 shows the difference of excess jobs paying up to three times the new ZLFN minimum wage and the missing jobs paying below the new minimum wage each quarter over the period 2018:1 to 2019:4 using our baseline specification. As is typical in event study frameworks, we make the normalization that this difference is zero in the last quarter of 2018, so that all the differences are relative to the quarter before the increase in the minimum wage. There are three significant findings that I would like to highlight. First, I find an apparent reduction in the jobs paying around the new ZLFN minimum wage during the first quarter after the increase. Second, the magnitude of the decrease in employment slightly increases during the first two quarters of the post-treatment period. Finally, there is no indication of a preexisting trend before treatment. All the lags are statistically indistinguishable from zero.

One potential source of concern is that the choice of MXN 350 above the new MW in ZLFN as the cut point to estimate the effect of minimum wage may be arbitrary. I explore this possibility by calculating a running sum of the job changes over each MXN 20 wage bin from the last quarter of 2018 to the last quarter of 2019. As we expect, the running sum reaches its minimum just below the new minimum wage in the ZLFN. It then increases, converging to a constant value around my estimated effect around the MXN 200 wage bin. All the running sums after that are statistically significant, which suggests that the minimum wage's negative impact is not dependent on what is going on at the top of the *SBC* distribution.

In Table 2, I assess the robustness of the main results in including additional controls for time-varying, unobserved heterogeneity. In column (1) I report the one-year post-treatment estimates for the baseline specification

shown in Figures 1 and 2. Column (2) adds municipality-by-time and wage-bin-by-municipality fixed effects. Column (3) adds wage-bin-by-time and municipality fixed effects. And, Column (4) allows wage-bin-by-municipality and wage-bin-by-time.

Except for the results in Column(2), the estimates from the additional specifications are relatively comparable to the baseline estimate. In all cases but, the policy is effective at reducing the number of jobs paying below the new minimum, what it is called missing jobs. At the same time, the number of jobs above the new minimum does not increase enough to compensate for all missing jobs except for the specification that includes municipality-by-time and wage-bin-by-municipality. Thus, the final result is a loss of formal employment, which range between 0.6% and 0.85%, although they are marginally statistically significant.

Regarding the results of Column(2), it is a surprising result given that the sign of the difference between the excess jobs and the missing jobs change in the last quarter. Figure 5 shows the difference of excess jobs paying up to three times the new ZLFN minimum wage and the missing jobs paying below the new minimum wage each quarter over the period 2018:1 to 2019:4 using our specification of Column (2). The reduction in the jobs paying around the new ZLFN minimum wage during the first quarter after the increase is apparent from this figure, and the magnitude of the decrease in employment slightly increases during the first two quarters of the post-treatment period. All these results are similar to the ones obtained with the baseline specification. However, they are not statistically significant albeit this is unsurprising given the loss of degrees of freedom caused by the broader set of fixed effects.

The descriptive statistics presented in Table 1 show a remarkable contrast in the employment distribution across industries between the ZLFN and the rest of the country. In particular, above half of the workers enrolled at the social security system in the ZLFN work in manufacturing, whereas this industry only represents a quarter of all formal employees in the private sector in the rest of the country. We expect that this industry faces more rigidity to adjust wages since they face more competition from international trade, increasing employment sensitivity to minimum wage changes. On the other hand, this industry may be less affected by this policy since it also offers higher-paying jobs. One advantage of the approach we used in this paper is that I can recover employment and wage responses even in industries where only a small fraction of workers are directly affected by the minimum wage increase by focusing on changes at the bottom of the distribution. This feature allows us to provide a more comprehensive assessment of the policy's

effect in manufacturing and across a range of industries.

In Figure 4 I report estimates for manufacturing industry. The Figure shows that the minimum wage bite is highly binding in this industry with a missing jobs estimate of 9.2%, which is larger than for the whole economy. I also find that the number of excess jobs at or above the minimum wage is smaller than the missing jobs in the manufacturing industry, and so the employment effect is negative ( $-1.4\%$ , std. err.  $0.7\%$ ), and statistically significant at the 5 percent level.

## 6 Conclusions

In this article, I study the formal employment effects of a regionally differentiated minimum wage increase in Mexico from the change in the frequency distribution of wages. The key benefit of this approach is that it allows us to assess the overall impact of the minimum wage on low-wage workers that are enrolled in the social security system for the private sector. I use an event study analysis exploiting a 100% minimum wage increase in one region of Mexico in comparison to a smaller wage increase, 16%, in the rest of the country. Moreover, I provide a robust appraisal of how the minimum wage affects the frequency distribution of wages. Similar to Cengiz et al. (2019), I calculate the number of overflow formal jobs just below the minimum wage, the number of overflow jobs at or slightly above the minimum wage, and the job changes in the upper tail of the wage distribution.

Our central estimates show that the number of excess jobs at and slightly above the minimum wage fails to match the number of missing jobs just below the minimum wage. In other words, I find evidence for employment losses at wages below three times the new minimum wage. In particular, I find that the employment in the ZLFN is 0.6% smaller due to the minimum wage increase, which implies a minimum wage elasticity equal to  $-0.007$ , on the lower end relative to the ones found in the literature but still negative. At the same time, I find no evidence of employment changes at or more than three times the minimum wage.

One limitation of this paper is that we only focus on the effect on net formal employment. We do not know the adjustment mechanism used by employers that resulted in the estimated reduction. Frequently, the discussion about the effect of the minimum wage on employment seems to revolve around the idea that job losses is the result of separations. However, hiring can also be a margin of adjustment Davis and Haltiwanger (1999), especially for jobs that present a high turnover rate, which is one feature of

low-wage jobs. It is interesting to know whether employers destroyed jobs by decreasing hirings or increasing separations. Moreover, another margin of adjustment is to simply exit from the formal sector altogether Acar, Bossavie, and Makovec (2019). This is left for future research.

Another limitation is that I cannot say much about the prevalent worker’s margin of adjustment. Since our dataset only has formal employment, I cannot see what is going on with jobs in other sectors (e.g. informal employment), unemployment or labor participation. In a context where informal employment is significantly high, it is interesting to explore whether minimum wage can be a hindrance to formal employment creation.

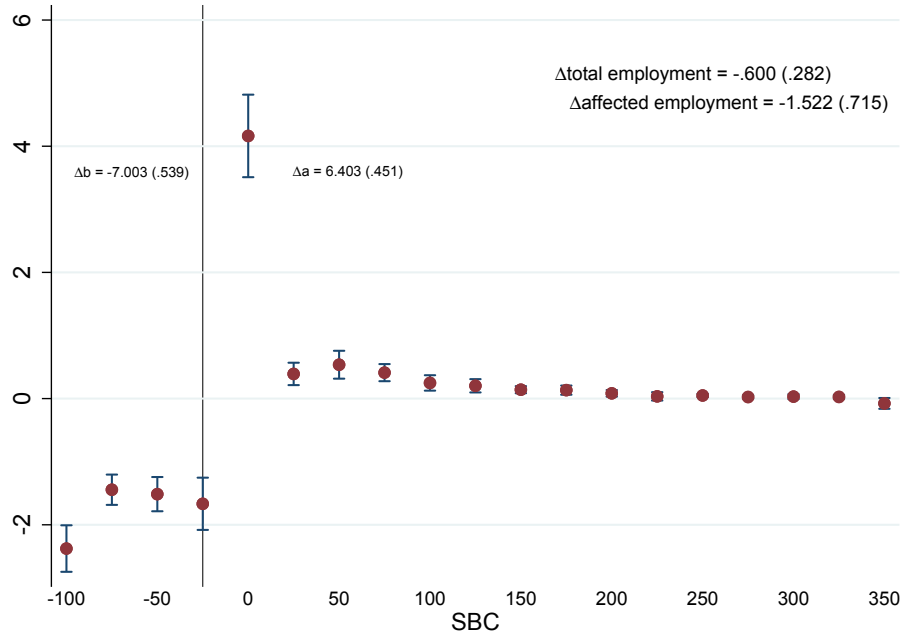
## References

- Acar, Aysenur, Laurent Loic Yves Bossavie, and Mattia Makovec (2019). *Do firms exit the formal economy after a minimum wage hike?: Quasi-experimental evidence from Turkey*. The World Bank.
- Allegretto, Sylvia et al. (2017). “Credible research designs for minimum wage studies: A response to Neumark, Salas, and Wascher”. In: *ILR Review* 70(3), pp. 559–592.
- Bell, Linda A (1997). “The Impact of Minimum Wages in Mexico and Colombia”. In: *Journal of Labor Economics* 15(3).
- Belman, Dale and Paul J Wolfson (2014). *What does the minimum wage do?* WE Upjohn Institute.
- Bouchot Viveros, Jorge Alfredo (2018). “The implications of a rise in the minimum wage on the Mexican labour market”. PhD thesis. University of Birmingham.
- Campos, Raymundo M, Gerardo Esquivel, and Alma S Santillán (2017). “El impacto del salario mínimo en los ingresos y el empleo en México”. In: *Revista CEPAL*.
- Card, David and Alan B Krueger (2015). *Myth and Measurement: The New Economics of the Minimum Wage-Twentieth-Anniversary Edition*. Princeton University Press.
- Cengiz, Doruk et al. (2019). “The effect of minimum wages on low-wage jobs”. In: *The Quarterly Journal of Economics* 134(3), pp. 1405–1454.
- Davis, Steven J and John Haltiwanger (1999). “Gross job flows”. In: *Handbook of labor economics* 3, pp. 2711–2805.
- Meer, Jonathan and Jeremy West (2016). “Effects of the minimum wage on employment dynamics”. In: *Journal of Human Resources* 51(2), pp. 500–522.

- Neumark, David (2018). “The Employment Effects of Minimum Wages: Some Questions We Need to Answer”. In: *Oxford Research Encyclopedia of Economics and Finance*.
- Neumark, David, William L Wascher, William L Wascher, et al. (2008). *Minimum wages*. MIT press.
- Stigler, George J (1946). “The economics of minimum wage legislation”. In: *The American Economic Review* 36(3), pp. 358–365.

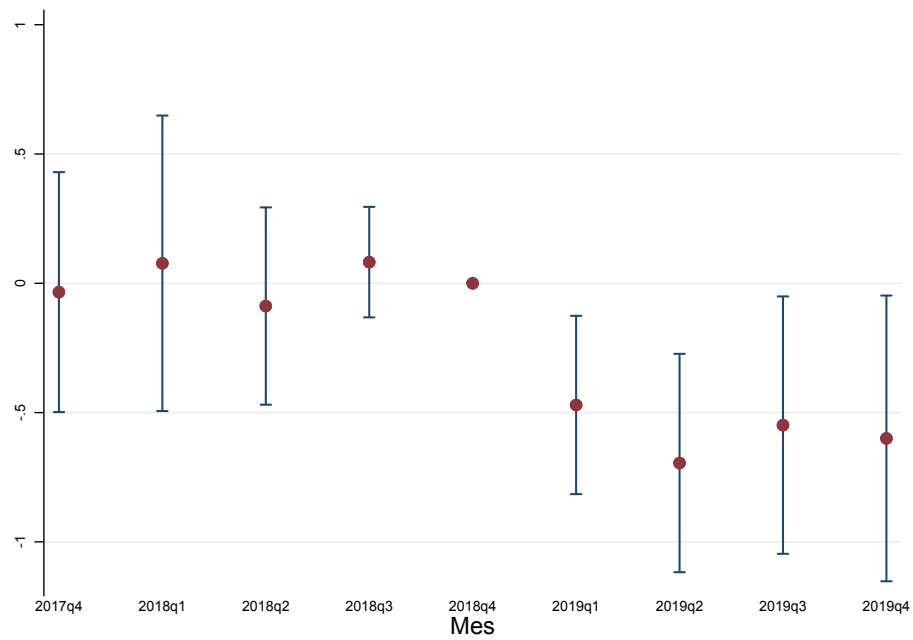
## A Figures and Tables

Figure 1: Impact of Minimum Wage Increase on the the Wage Distribution of Total Employment Enrolled at IMSS



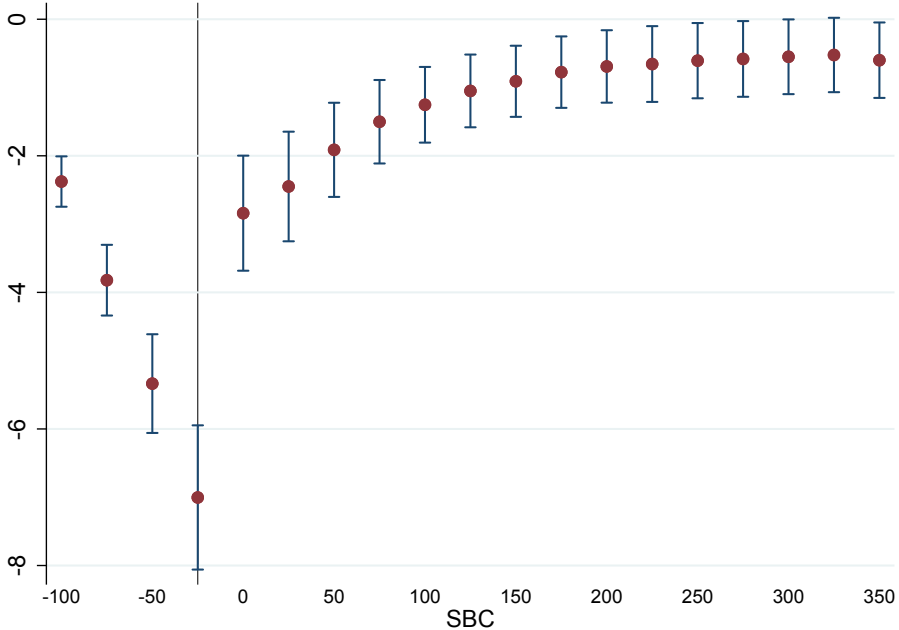
Note: The figure shows the main results from our event study analysis (see equation 1) exploiting a 100% minimum wage increase in the municipalities at the Northern Mexican border in 2019 relative to a 16% increase in the rest of the country.

Figure 2: Impact of ZLFN Minimum Wage over Time: 2017:IV to 2019:IV



Note: The figure shows the main results from our event study analysis (see equation 1) exploiting a 100% minimum wage increase in the municipalities at the Northern Mexican border in 2019 relative to a 16% increase in the rest of the country.

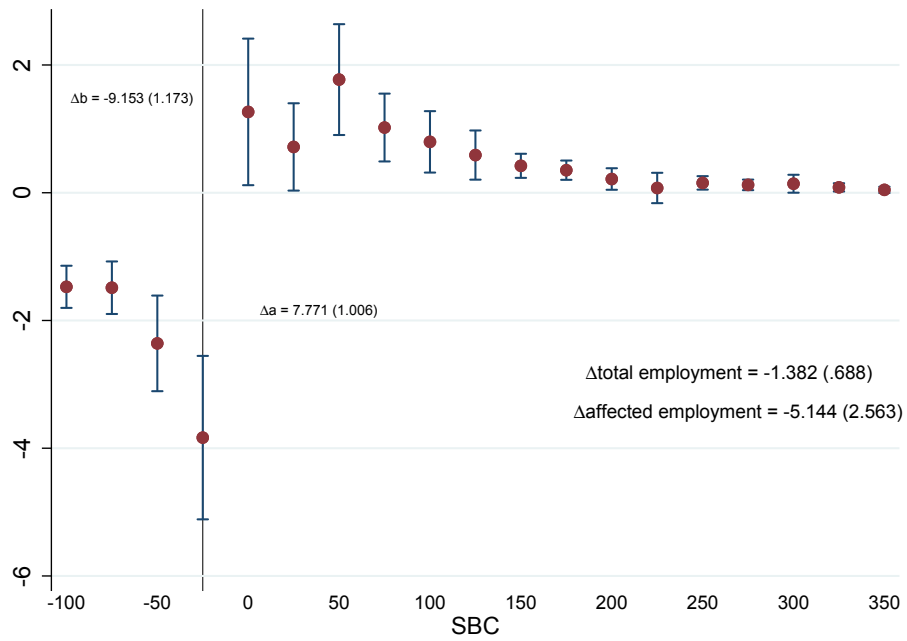
Figure 3: Accumulated Job Changes over Wage Bins from 2018:IV to 2019:IV



Note: The figure shows the main results from our event study analysis (see equation 1) exploiting a 100% minimum wage increase in the municipalities at the Northern Mexican border in 2019 relative to a 16% increase in the rest of the country.

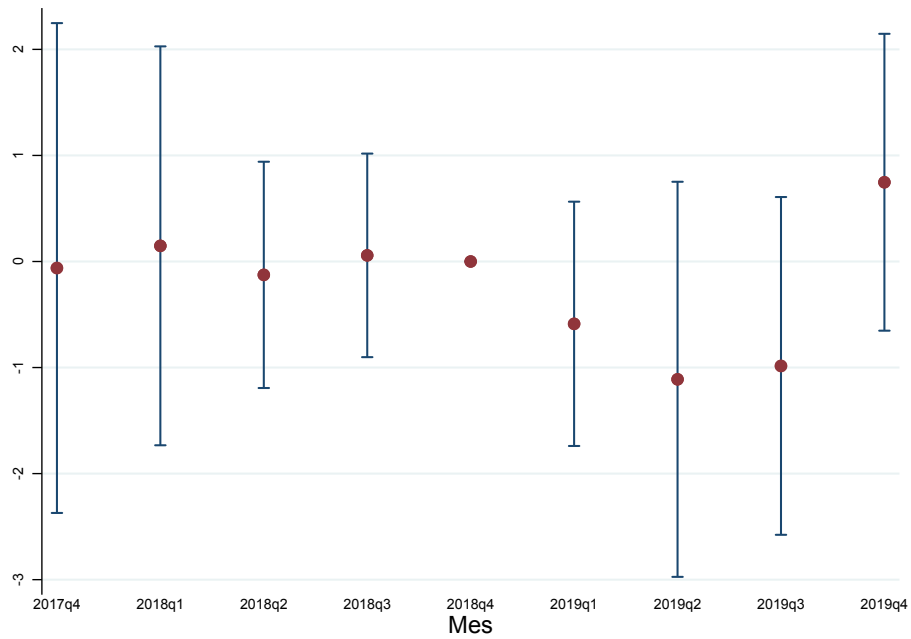


Figure 4: Impact of Minimum Wage Increase on the the Wage Distribution of Manufacturing Employment Enrolled at IMSS



Note: The figure shows the results from our event study analysis (see equation 1) exploiting a 100% minimum wage increase in the municipalities at the Northern Mexican border in 2019 relative to a 16% increase in the rest of the country. The universe in this figure is manufacturing formal workers

Figure 5: Impact of ZLFN Minimum Wage over Time: 2017:IV to 2019:IV



Note: The figure shows the results from our event study analysis (see equation 1) exploiting a 100% minimum wage increase in the municipalities at the Northern Mexican border in 2019 relative to a 16% increase in the rest of the country. The specification adds municipality-by-time and wage-bin-by-municipality fixed effects.

Table 1: Descriptive Statistics

	(1) Total sample	(2) ZLFN	(3) Rest
Female	0.38	0.40	0.37
Age	37.65	37.04	37.72
Agriculture	0.04	0.02	0.04
Commerce	0.20	0.14	0.21
Electricity	0.01	0.01	0.01
Construction	0.08	0.05	0.09
Manufacturing	0.27	0.54	0.24
Extractive	0.01	0.00	0.01
Personal Services	0.23	0.14	0.25
Social Services	0.11	0.06	0.11
Transportation	0.06	0.05	0.06
Employer Size	1766.66	1612.53	1784.38
Affected Workers	0.15	0.29	0.14
N	20,457,926	2,109,465	18,348,461

This table reports the descriptive statistics of MXN 5 wage bins at the national level and minimum wage region.

Table 2: Robustness Analysis

	(1)	(2)	(3)	(4)
	(1)	(2)	(3)	(4)
Below MW	-7.003	-5.390	-6.840	-7.303
S.E.	(0.539)	(0.627)	(0.538)	(0.539)
Above MW	6.403	6.137	6.295	6.454
S.E.	(0.451)	(0.692)	(0.449)	(0.548)
Effect	-0.600	0.747	-0.545	-0.850
S.E.	(0.282)	(0.714)	(0.289)	(0.457)

The table reports the effects of a minimum wage increase based on the event study analysis (see equation (1)) a 100% minimum wage increase in the municipalities at the Northern Mexican border in 2019 relative to a 16% increase in the rest of the country.