The Impact of Minimum Wage on Low Wage Formal Employment

León Fernández Bujanda
Banco de México
October 2020

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 México.
Introduction

• In this paper, difference-in-differences design developed by Cengiz et al. (2019) to estimate impact of MW increase on formal employment in Mexico.

• Extensive and much-disputed literature on the effects of minimum wage on employment
  • Regional variation in the implementation of this policy: Allegretto et al., (2017), Neumark and Wascher (2008), Card and Krueger (2015), Stigler (1946).
  • Total employment: Cengiz et al. (2019) and Meer and West (2016)

• Findings
  • Employment is 0.6% smaller due to the MW increase, which implies a MW elasticity equal to -0.007, on the lower end relative to the ones found in the literature but still negative.
Minimum Wage in Mexico

Real Minimum Wage

Minimum Wage Regions

Source: Conasami

21/10/2020

XXV (Digital) Meeting of the Central Bank Researchers Network
Data

• Data: matched employer-employee dataset from IMSS administrative records.

• Each worker is assigned to a MXN 5 wage bin at the municipal level according to their daily contribution wage (SBC)
  • \([MW, MW+5) [MW+5, MW+10), ..., [1440, ...]\).

• Some MXN 5 bins may be sparse with very few or no workers but not due to sampling error.

• Employers might misreport wages, which may introduce attenuation bias.

• The municipal-monthly-level population was estimated by linearly interpolating the census data using the month as the running variable.
## Descriptive Statistics (November 2018)

<table>
<thead>
<tr>
<th></th>
<th>Whole Population</th>
<th>ZLFN</th>
<th>Rest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>0.38</td>
<td>0.40</td>
<td>0.37</td>
</tr>
<tr>
<td>Age</td>
<td>37.65</td>
<td>37.04</td>
<td>37.72</td>
</tr>
<tr>
<td>Commerce</td>
<td>0.20</td>
<td>0.14</td>
<td>0.21</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>0.27</td>
<td>0.54</td>
<td>0.24</td>
</tr>
<tr>
<td>Personal Services</td>
<td>0.23</td>
<td>0.14</td>
<td>0.25</td>
</tr>
<tr>
<td>Social Services</td>
<td>0.11</td>
<td>0.06</td>
<td>0.11</td>
</tr>
<tr>
<td>Employer Size</td>
<td>20.96</td>
<td>26.83</td>
<td>20.45</td>
</tr>
<tr>
<td>Affected Workers</td>
<td>0.15</td>
<td>0.29</td>
<td>0.14</td>
</tr>
<tr>
<td>N</td>
<td>20,457,926</td>
<td>2,109,465</td>
<td>18,348,461</td>
</tr>
</tbody>
</table>
Methodology

Source: Cengiz et al. (2019)
Methodology

• Regression:

\[
\frac{E_{mjt}}{N_{mt}} = \sum_{l=-5}^{4} \sum_{k=-100}^{350} \alpha_{kl} I_{mjl}^k + \text{frontera}_m + \rho_t + \varepsilon_{mjt}
\]

• \( I_{mjl}^k = 1 \) if the minimum wage was raised \( l \) quarters from I-2019, for the MXN 5 wage bin \( j \) that fall between \( k - 25 \) and \( k \) MXN relative to the new MW in the ZLFN, and for \( m \) that is located in ZLFN.

• Difference in the number of jobs in the wage band \( k \)

\[
\Delta e_{k,l} = \frac{\alpha_{k,l} - \alpha_{k,0}}{\frac{E}{N_{IV \, 2018}}}
\]
Methodology

• Change in the number of jobs
  • Below the new minimum wage
    \[ \Delta b = \sum_{k=-100}^{\frac{-25}{100}} \Delta e_{k,l} \]
  • Above the new minimum wage
    \[ \Delta a = \sum_{k=0}^{\frac{350}{100}} \Delta e_{k,l} \]
• Net
  \[ \Delta e = \Delta a + \Delta b \]
Results

Impact of Minimum Wage Increase on the Wage Distribution

Elasticity = -0.007
Results

Impact of Minimum Wage Increase over Time

![Graph showing the impact of minimum wage increase over time.](image)
## Results

### Robustness Check

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below MW</td>
<td>-7.003</td>
<td>-6.840</td>
<td>-7.303</td>
<td>-5.390</td>
</tr>
<tr>
<td>S.E.</td>
<td>(0.539)</td>
<td>(0.538)</td>
<td>(0.539)</td>
<td>(0.627)</td>
</tr>
<tr>
<td>S.E.</td>
<td>(0.451)</td>
<td>(0.449)</td>
<td>(0.558)</td>
<td>(0.692)</td>
</tr>
<tr>
<td>Effect</td>
<td>-0.600</td>
<td>-0.545</td>
<td>-0.850</td>
<td>0.747</td>
</tr>
<tr>
<td>S.E</td>
<td>(0.282)</td>
<td>(0.289)</td>
<td>(0.457)</td>
<td>(0.714)</td>
</tr>
<tr>
<td>Municipality-by-Time FE</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Wage-bin-by-municipality FE</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Wage-bin-by-time FE</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Municipality FE</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Conclusions

• Formal employment effects of a regionally differentiated minimum wage increase in Mexico from the change in the frequency distribution of wages.

• Event study analysis exploiting a 100% minimum wage increase in one region of Mexico in comparison 16% increase in the rest of the country.

• Employment in the ZLFN is 0.6% smaller due to the MW increase, which implies a MW elasticity equal to -0.007, on the lower end relative to the ones found in the literature but still negative.

• Focus on the effect on net formal employment.

• Not much about worker’s margin of adjustment.