



The effect of doubling the minimum wage and decreasing taxes on inflation in Mexico[☆]

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ABSTRACT

We analyze the effect on inflation of doubling the minimum wage and cutting the value-added tax in half. Annual inflation decreased by 1.8 percentage points, suggesting that the minimum wage increase had a limited or even null effect on prices.

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1. Introduction

Mexico elected a new government in the summer of 2018, in a context of high levels of violence in municipalities on the U.S. border and throughout the country, and of growing anti-immigration rhetoric in the U.S. For these reasons, and also because of concerns about migration from Central American countries, the newly-elected president of Mexico, Andrés Manuel López Obrador, announced his intention to generate better working conditions at the border to reduce incentives to cross to the U.S. The new government implemented a set of place-based policies that went into effect in the bordering municipalities beginning in January 2019. These included doubling the nominal minimum wage, halving the value-added tax (VAT) from 16 to 8 percent, reducing the corporate income tax by one-third, and adjusting the price of energy goods to make them comparable to

those in bordering counties in the U.S. This set of policies is one of the boldest recent place-based policies in the world.

In this paper, we restrict our analysis to the effects of these policies on inflation, taking advantage of their regional variation to estimate their joint effect. In particular, by using a rich dataset that includes the prices of goods with and without VAT in different cities throughout Mexico, we are able to shed some light on the magnitude of the effect on prices of doubling the minimum wage.

2. Theory: Predictions

We might expect one of two opposite effects of these policies on the inflation of bordering municipalities. First, the significant increase in the minimum wage might increase prices. The meta-analysis of Lemos (2008), as well as more recent research using scanner price data, finds that a 10 percent increase in the minimum wage raises prices by an average of 0.4–1 percent (see Harasztosi and Lindner, 2019; Leung, 2018). This implies that a doubling of the minimum wage may potentially increase inflation by 4 to 10 percentage points. However, the actual elasticity depends on how much the minimum wage “bites” and on labor costs as a share of total costs. Both of these factors are lower in Mexico than elsewhere. Labor costs (wages) are approximately 12 percent of total costs (using the 2019 Economic Census of

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establishments) and the minimum wage increase affects approximately 31 percent of the workers who were earning less than the new minimum wage. By our calculations, the wages of these workers must increase by approximately 35 percent to reach the new minimum wage level. The total expected effect on prices is thus approximately 1.3 percentage points ($12 \times 31 \times 35$ percent). With a lighthouse effect of the minimum wage on the wage structure, we calculate that the effect may increase to 1.4–1.5 percentage points ($12 \times 100 \times 12$ percent).¹

The reduction in the value-added tax (VAT) and taxes on corporate income for firms that meet certain requirements are also key.² The northern border had suffered an increase in VAT from 11 to 16 percent in 2014. Mariscal and Werner (2018) exploit this natural experiment to estimate a pass-through rate for inflation from the VAT increase of 16–20 percent. The purely mechanical effect on inflation of a decrease in the VAT from 16 to 8 percent is –6.9 percentage points (based on the simple ratio of the two rates). However, taking into account the magnitude of the pass-through rate would imply a decrease in inflation of 1.1–1.4 percentage points.

If these calculations are correct, then we should expect either a small positive effect or an approximately zero effect of these two policies on inflation, and we can then make some inferences about their magnitude. The data used is publicly provided by the Mexican National Institute of Statistics and Geography (INEGI) and includes the Consumer Price Index (CPI) for 46 cities in Mexico. The data can be further disaggregated for each good and service included in the calculation of the CPI. The available data allows us to calculate inflation rates for products with and without VAT, and by categories like merchandise and services; since the minimum wage “bites” more in services, where labor costs are a larger share of the total cost, we would expect a greater effect on services if the minimum wage effect were truly significant.

3. Methods

We employ two different methods to calculate the effect of this minimum wage and tax policy on annual inflation. First, we calculate a synthetic control using 41 cities that are not located on the northern border as potential donors (Abadie et al., 2010). We aggregate the data for the five treated municipalities into one treated unit. This method searches for trends in the donor cities that are similar to the treated unit in the pre-treatment period (2015–2018), assigning weights (which add up to one) to the donor cities that are most similar. It does not use all of the lags from the pre-treatment period to construct the control group, only half of them. We select the model with the minimum root mean squared prediction error (RMSPE) in the pre-treatment period. Statistical inference is obtained using a permutation test with the donor cities. We report the *p*-value of this test.

Second, we estimate a fixed effects regression (time and municipalities) corrected for first degree autocorrelation. Inflation, our dependent variable, is correlated over time (degree one). The fixed effect regression is estimated using feasible generalized least squares. The key explanatory variable is just a dichotomous variable for the border municipalities in 2019, and we report confidence intervals for it at the 95 percent level.

¹ The lighthouse effect is the effect of the minimum wage not only on wages below the new minimum wage, but on the wage structure. A full lighthouse effect implies that all wages increased by the same percentage as the increase in the minimum wage.

² The reduction in the corporate income tax cut excludes the financial and real estate sectors, *maquiladoras*, taxpayers under audit, e-commerce, wages, dividends, professional services, and others. There is no evidence that corporate tax cuts substantially affect prices (Suárez-Serrato and Zidar, 2016).

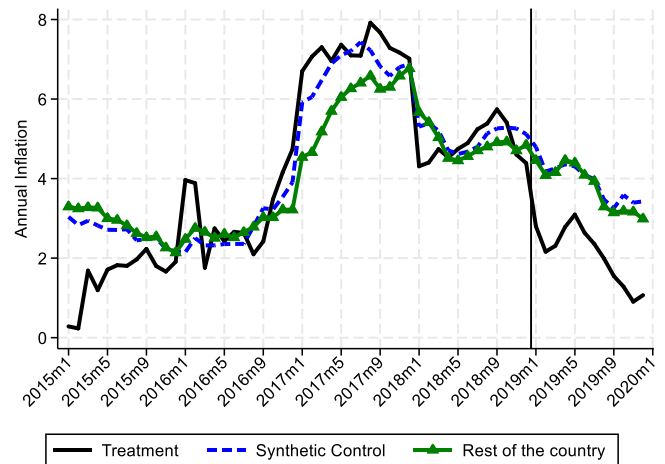


Fig. 1. Annual inflation. Notes: Authors' calculations. Each group uses the weight of the municipalities employed to calculate the Consumer Price Index.

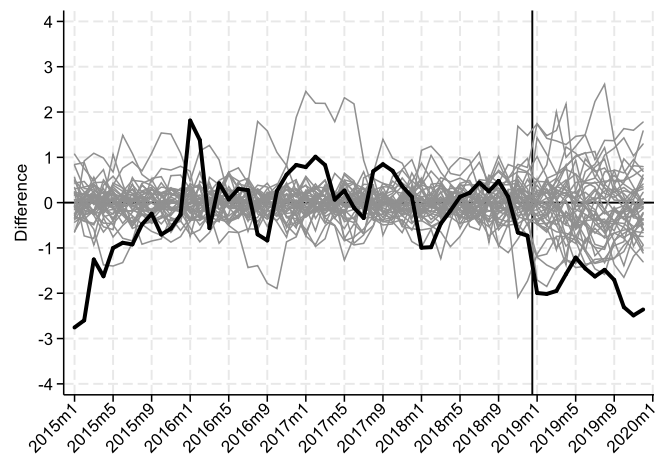


Fig. 2. Simulated permutations. Notes: Authors' calculations. The bold line is the difference between the treated group and its synthetic control. Each light gray line is the difference between one control unit (41 municipalities) that is assumed to be treated and its synthetic control. The calculations are based on placebos with less than 2.5 times the RMSPE.

4. Results

Fig. 1 shows annual inflation for the treatment group (the weighted average of the five border municipalities, employing the weights used in the calculation of the CPI), for the rest of the country, and for the synthetic control using the method developed by Abadie et al. (2010).³ Inflation is relatively low from 2015:1 until 2016:10, when it starts to increase. In 2017, inflation is around 7 percent, and then it starts to decrease. The figure shows the importance of a synthetic control that attempts to mimic the behavior in the treatment group. In the period of high inflation, annual inflation in the synthetic group looks more like the treatment group than the rest of the country. When the policies were implemented in January 2019, inflation started to decrease sharply in border municipalities.

Fig. 2 shows the difference in inflation between the border municipalities and the synthetic control (bold line) as well as the simulated permutations (light gray lines). Before the treatment

³ Inflation is a better measure than using the CPI directly. There is a clear seasonal pattern in the border region due to energy subsidies. However, results using the CPI are provided in the Supplementary Materials.

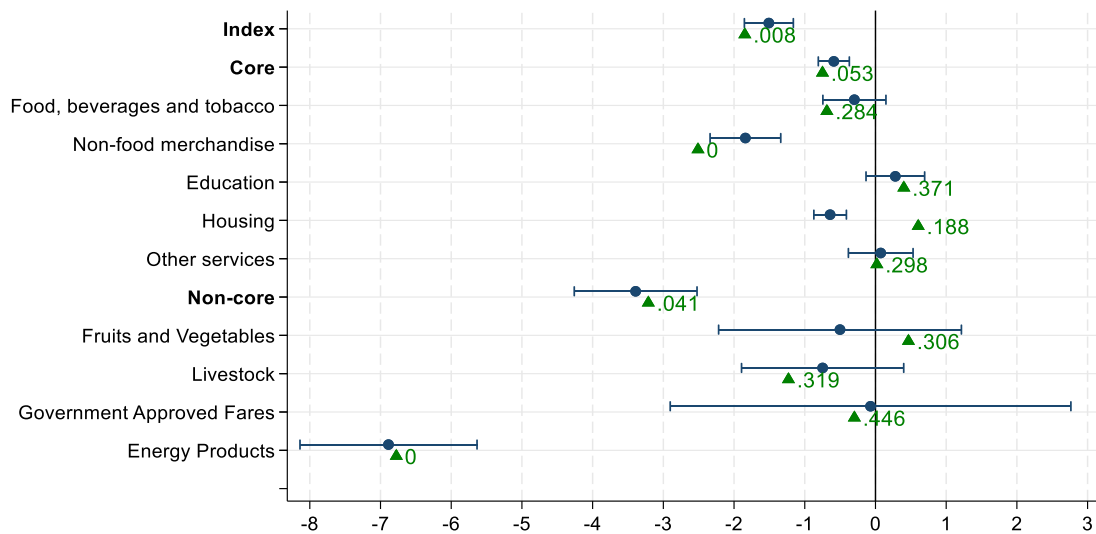


Fig. 3. Effect on inflation for core and non-core categories. Notes: Authors' calculations. Estimates in circles are from a fixed effects (time and municipalities) regression in which the key explanatory variable is a dummy for the northern border municipalities in 2019. The regression corrects for first degree autocorrelation. 95 percent confidence intervals are shown. The estimation period is from 2015:1 to 2019:12. Triangles denote average estimates using the synthetic control method, and the number beside them shows the average p -value for the treatment period (2019). The calculations are based on placebos with less than 2.5 times the RMSPE.

period, the difference in inflation is close to zero. However, beginning in January 2019 there is a decrease in inflation for the treatment group as compared to the synthetic control. There is a sharp decrease in the first quarter of approximately 2 percentage points. For the second quarter the effect is less, but still negative, and by the third quarter it is approximately 1.5 percentage points. The fourth quarter negative effect is greater, approximately 2.5 percentage points. The simulated permutations imply that the effect is statistically significant, as there are very few light gray lines that show a larger estimate than the true effect. The average effect of the policy over the year 2019 is -1.8 percentage points and is statistically significant.

Fig. 3 shows the average effect of the policy using the synthetic control method (in triangles) and a fixed effects regression corrected for first degree autocorrelation (in dots). We include the p -value from the simulated permutations test and 95 percent confidence intervals for the regression. We expect the policy to have differential effects across categories because of differences in the proportion of workers that are affected by the minimum wage increase, and differences in the effects of the tax cut. The main categories are Core inflation and Non-core inflation. The first includes food and beverages, non-food merchandise, education, housing, and other services, and the second includes fruits and vegetables, livestock, government-approved fares, and energy products.

Fig. 3 indicates that the two methods produce similar estimates of the joint impact on inflation of the minimum wage and VAT cut. For both methods, the impact on general inflation averages -1.6 percentage points. The largest decline is in energy products, which show essentially a full pass-through of the VAT reduction. Excluding these products, there is a smaller effect on core inflation, approximately -0.7 percentage points. This negative effect is driven mainly by non-food merchandise. There is close to zero effect on education, housing (which shows opposing signs in the two estimations), and other services. This is the result we expected in Section 2: the effect is less negative in sectors in which labor costs are higher and which therefore experience a greater pass-through effect from the minimum wage increase.

Finally, Fig. 4 shows the average estimates for products with and without VAT. If the minimum wage is affecting prices, we should observe an increase in inflation in products that are not subject to VAT (non-processed foods, medicines, education, and

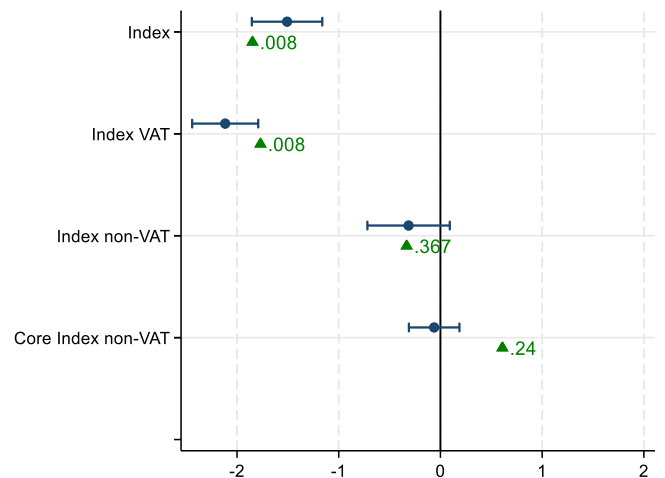


Fig. 4. Effect on inflation for products with and without VAT. Notes: See notes for Fig. 3. Core index non-VAT excludes transportation.

transportation). First, the decline in inflation is mainly driven by products subject to VAT, as expected. Second, the effect on products without VAT is close to zero. Using the synthetic method, the estimates are not statistically significant. Using the fixed effects regression, the estimates are slightly negative and we can reject that they are at least 1 percent, as theory would predict. The fact that there is no statistically significant positive effect on products without VAT suggests that the effect of the minimum wage increase on prices was either null or very small.

5. Conclusions

In this paper we estimate the joint effect on short-run inflation of a large and meaningful place-based policy in the Mexican municipalities that share a border with the U.S. The policy doubled the minimum wage and cut the VAT in half in January 2019. Previous evidence and mechanical calculations suggested a close to zero effect. Nonetheless, using a synthetic control method we find that inflation decreased an average of 1.8 percentage points in the first year. This means that the effect of the cut

in VAT predominated over the effect (if any) of the minimum wage increase. This result, together with the empirical estimates for goods without VAT, suggests that the effect of doubling the minimum wage in the Mexican border municipalities was either very small or null.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary material

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.econlet.2020.109051>.

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