Abstract
I analyze price adjustments following Mexico’s 2014 tax on sugar-sweetened beverages (SSBs). First, I show evidence of tax over-shifting: in response to a one-peso tax, retailers increased prices by 1.32 pesos. I find that local competition partially limits over-shifting. Second, when adjusting prices, stores use a “catch-up” strategy meaning the price of cheaper products increases more than the price of more expensive products. Third, I find evidence of uniform adjustments to the tax at the store-chain level targeting modal prices across chains. Together, these results suggest that retailers facing more competition do in fact lower prices that are initially set by a store’s chain and contradict the hypothesis that taxes are smoothly passed into prices.

Introduction
The use of a tax policy to reduce consumption assumes that prices will rise in response to the tax, which, in turn, would reduce the quantity demanded. Theoretically, however, the burden of taxation depends on the market structure. Under perfect competition, taxes can be either partially or fully transmitted into prices. Under imperfect competition, over-shifting is possible—i.e., a dollar in tax increases prices by more than one dollar. Moreover, most tax incidence models deliver the prediction that more competition reduces firms’ incentives to shift taxes under the same conditions that induce over-shifting.

In this paper, I test the conventional wisdom using the Mexican excise tax of one peso (Mxn) per liter on SSBs effective January 1, 2014. I first estimate the average tax pass-through on retail prices and evaluate its sensibility to local competition. Next, I study a potential mechanism by which several empirical studies, including this one, find that conditional on over-shifting, local competition alone cannot avoid excessive shifting. I show how pricing strategies such as uniform chain pricing, the widespread use of salient price points, and the pre-tax distribution of prices influence the shifting of the tax.

Data
I use a proprietary dataset provided by the Federal Consumer Protection Agency in Mexico (PROFECO), which contains prices at the product-store-week level and comprehensive establishment information for 182 independent supermarkets belonging to 10 chains across the country in 18 out of 32 Mexican States through 2013 and 2014.

I supplement this data with the Mexican Census of Economic Units for 2013 & 2014 (DENUM) to approximate local competition. Using geolocation information, I count the number of competing stores within a certain driving distance (10 km) and time (20 min) from stores for which price information is available. These metrics include all available information on roads, paths, and highways and also consider traffic and road conditions between two locations.

Empirical Strategy
I estimate the effect of the tax into prices using a difference-in-differences regression.

\[ P_{ij} = \delta_1 + \delta_2 + \gamma_1 + \beta_1 \cdot (\text{Tax}_1) + \text{Tax}_2 + \epsilon_{ij} \] (1)

Where \( P_{ij} \) is the per-liter price of product \( i \) in store \( j \) at time \( t \) (year-month), \( \text{Tax}_1 \) and \( \text{Tax}_2 \) are indicators identifying taxed products and after-tax periods, and \( \delta_1, \gamma_1, \) and \( \delta_2 \) represent brand-preparation (i.e., 1L Coke), time, and establishment fixed effects, respectively.

The coefficient \( \beta_1 \) captures the tax pass-through estimate; \( \beta_1 = 1 \) implies perfect shifting, while \( \beta_1 \neq 1 \) implies either over- or under-shifting and is identified by comparing taxed product prices before and after the tax and to prices of non-taxed products. I use non-taxed beverages sold at the same stores as a control group. Thus, the identifying assumption is that prices of taxable products would not have evolved differently from prices of non-taxable goods absent the tax.

To test whether the tax pass-through decreases as local competition rises, I add one term to (1):

\[ P_{ij} = \delta_1 + \delta_2 + \gamma_1 + \beta_1 \cdot (\text{Tax}_1) + \text{Tax}_2 + \beta_2 \cdot (\text{Tax}_1) \times \text{Competition} + \text{Competition} \times \epsilon_{ij} \] (2)

The variable \( \text{Competition} \) captures the local competition (std.) faced by each store and the interaction \( (\text{Tax}_1) \times \text{Competition} \) captures whether stores facing larger competitive pressures are less likely to over-shift the tax. The effect of interest is captured by \( \beta_2 \), its sign and magnitude embody an empirical estimate of the effect of competition on the ability of establishments to shift the tax.

Results and Conclusion
I study the 2014 SSB tax pass-through in Mexico. I show that the tax was over-shifted at an average rate of 32% and, consistent with the theory, supermarkets facing higher levels of competition were less likely to over-shift the tax.

However, competition is not enough to cancel over-shifting as retailers follow systematic pricing practices. Stores use a catch-up strategy to shift the tax which involves major adjustments to cheap goods and minor adjustments to expensive items, targeting a handful of post-tax modal prices, a scheme enabled by the use of discrete price points in the market.

These arguments appear conflicting: local competition affects individual pricing but few post-tax modal prices suggest centralized choices. To reconcile these arguments, I analyze prices at the chain level. I find that chains uniformly adjusted prices across stores, thereby increasing the frequency of some prices. However, contrary to a rigid one scheme, stores facing the highest competitive pressures adjusted prices down, indicating a mechanism for the negative relationship between competition and tax pass-through.

The key implication of these results is that the commonly used regression of prices on tax indicators is not entirely informative. This approach assumes that prices respond to taxes smoothly and that markets are regulated by standard-model criteria, such as competition. Conversely, pricing practices, shown to be large shifting determinants are often overlooked.

**Results and Conclusion**

(I find that local competition partially limits over-shifting.)

For example, if the SSB tax price is 0.60 pesos, followed by 1.20 pesos, 1.80 pesos, and 2.40 pesos.

The frequency of such after-price increases is modeled using a logit model.

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