

A Comprehensive Examination of Price Elasticities of Tobacco Products: Evidence from Commercial Store Scanner Data

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Introduction

Cigarettes are the most popular tobacco product accounting for more than 80 percent of tobacco industry's revenue. Although many studies have looked at the demand for cigarettes, only a few have looked at the sales and demand of other tobacco products.

Our aim is to examine the demand of other tobacco products and NRT products. We use commercial store scanner data to estimate the own price elasticities for each product, as well as the cross-price elasticity between cigarettes and these products.

The products examined include:

Combustible Tobacco:

- cigars, cigarillos, little cigars, loose tobacco, pipe tobacco

Smokeless:

- moist snuff, dry snuff, chewing, snus,

E-cigarettes:

- reusable, disposable

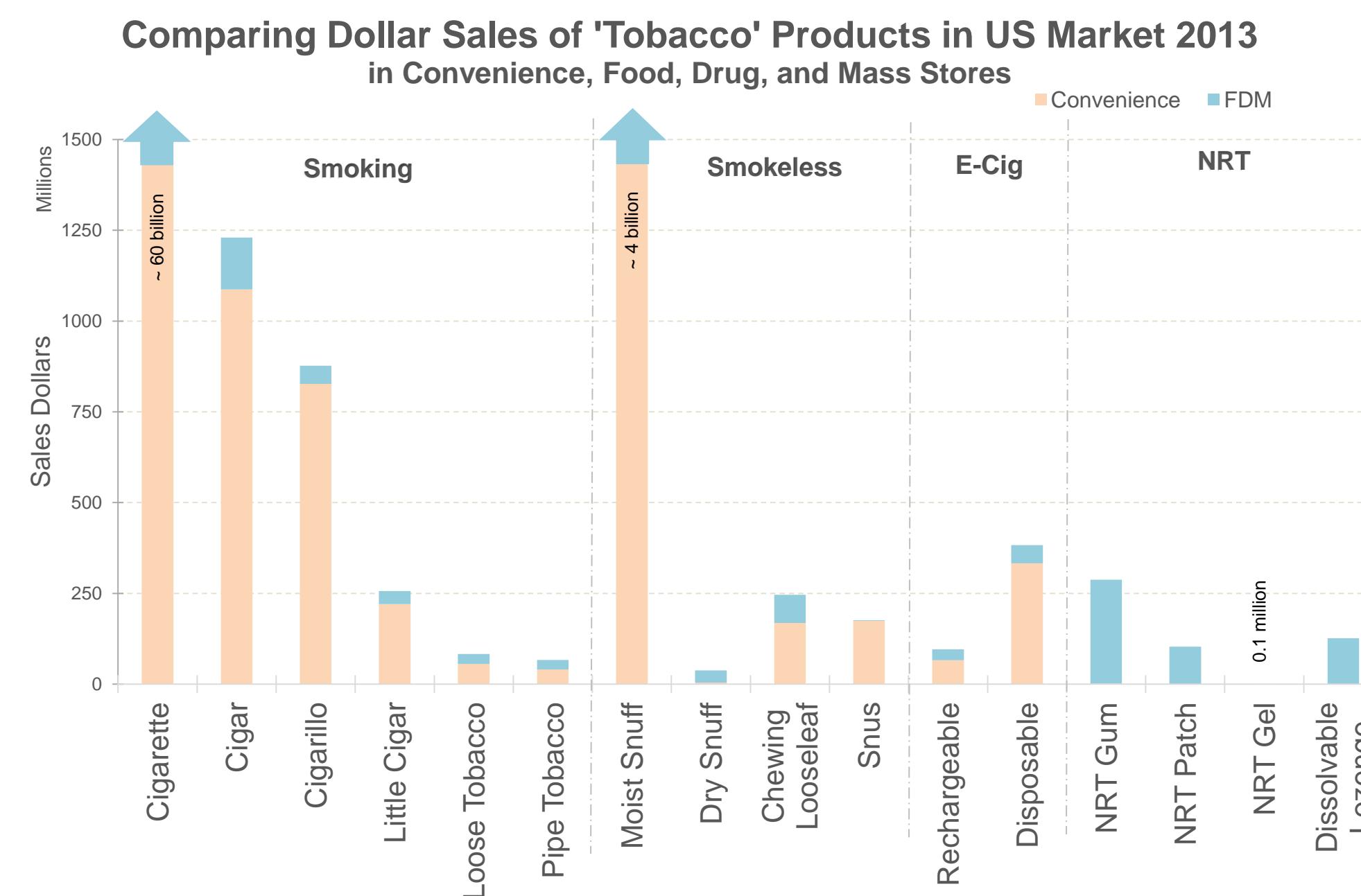
NRT products:

- patches, gum, gel, dissolvable lozenges

Methods

Data

The data used in this study come from the store scanner data compiled by the Nielsen Company and consists of quarterly prices and sales of tobacco products from 2007 to 2013 for 52 US markets, for food, drug and mass stores, and from 30 markets for convenience stores. A Nielsen market consists of groups of counties centered on a major city, and in together represent approximately 80% of the total US population.



Methods (cont.)

Models

We construct per capita sales volume for each product as the dependent variable by dividing the total sales volume in a market/quarter/store type by the total population in that market/quarter.

We estimate the following two models for each product controlling for year, quarter, market-store fixed effects, and smoke free air laws:

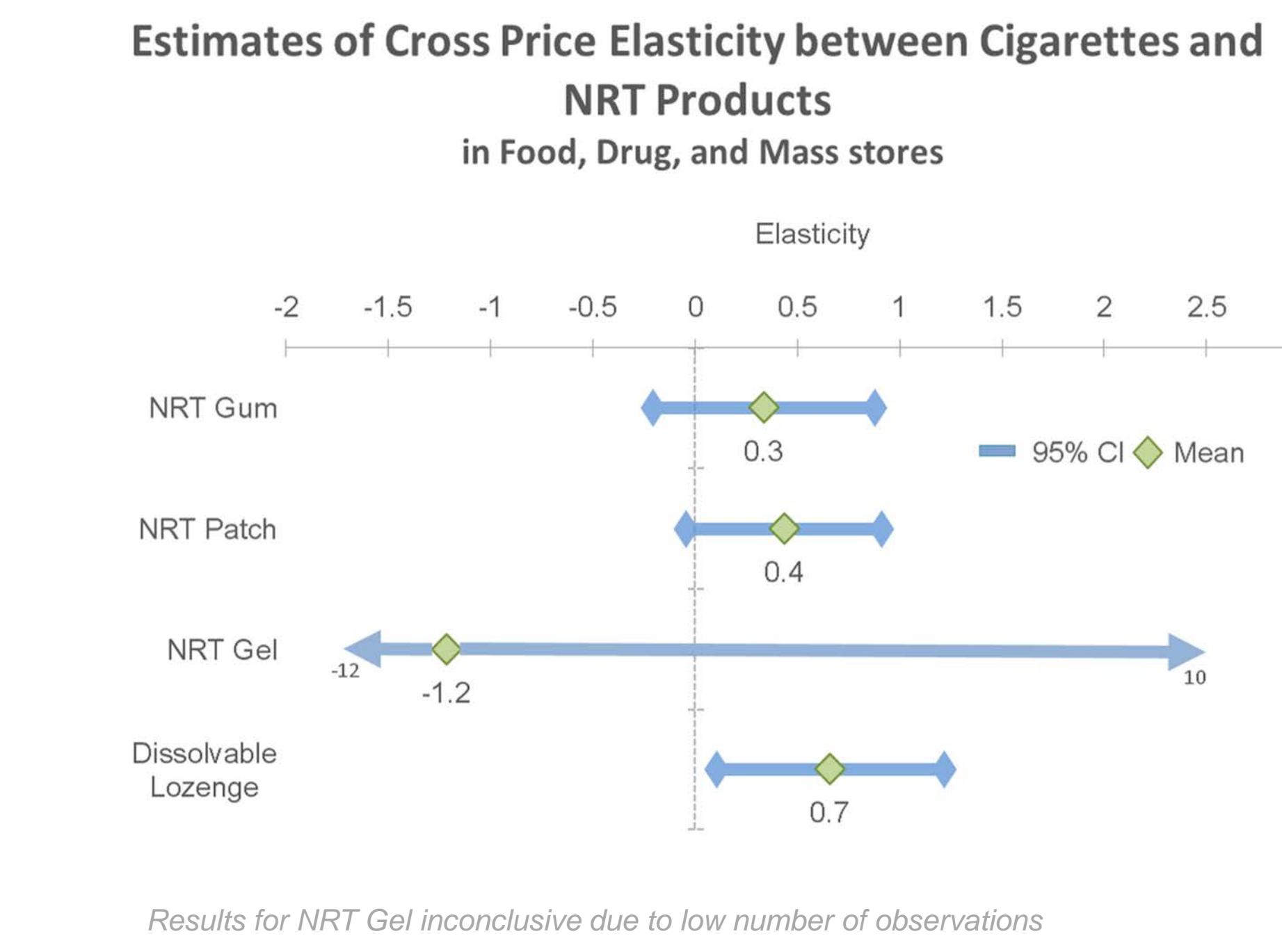
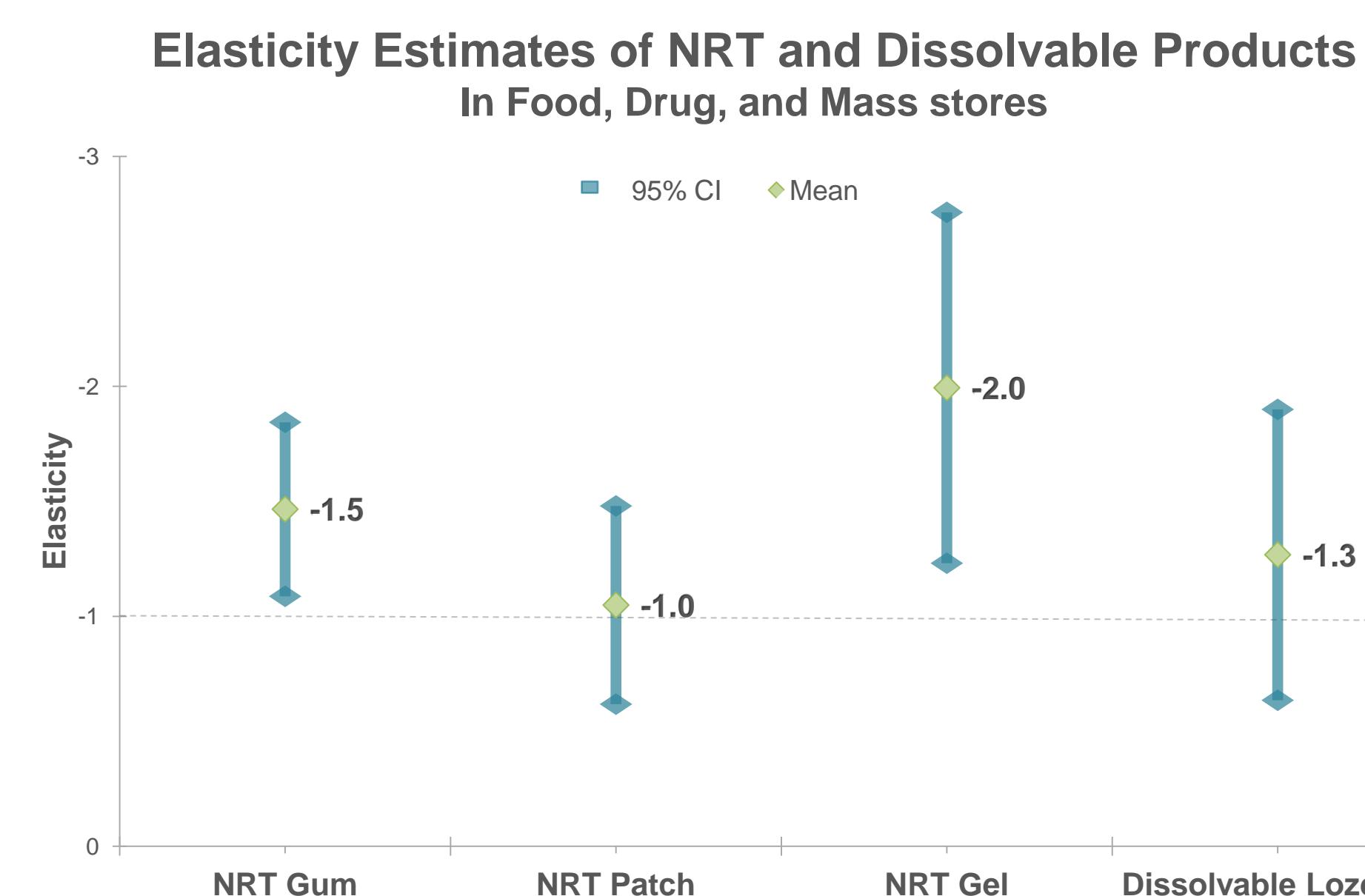
Own Price Elasticity:

$$\ln(\text{SalesVolume})_{\text{market/quarter/storetype}} = \text{intercept} + \beta_1 \ln(\text{ProductPrice})_{\text{market/quarter/storetype}} + \beta_2 \text{SFA-index}_{\text{market/quarter}} + \beta_3 \text{Year} + \beta_4 \text{Quarter} + \beta_5 (\text{Market-StoreDummy}) + \text{error}$$

Cross Price Elasticity with Cigarette Price:

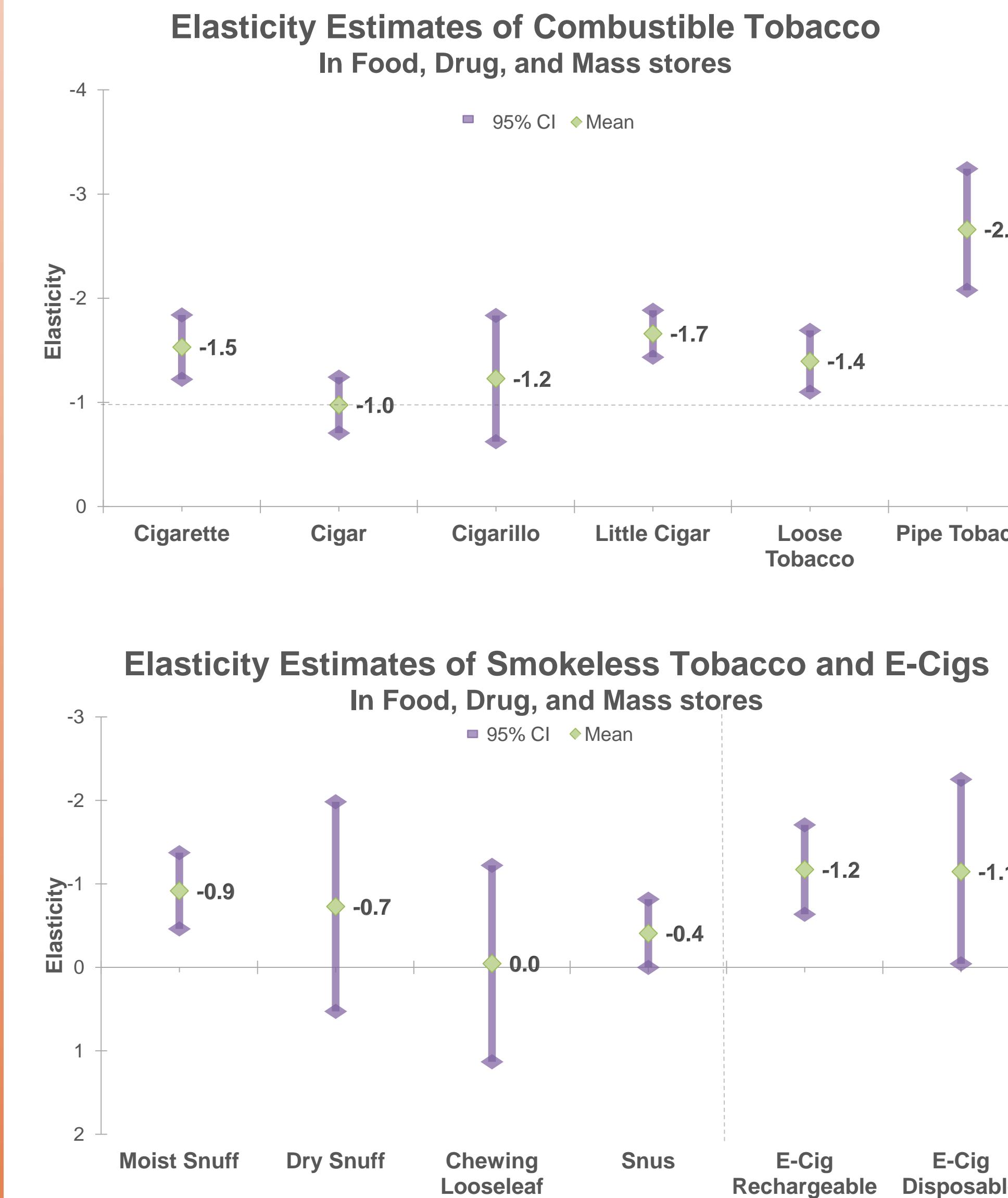
$$\ln(\text{SalesVolume})_{\text{market/quarter/storetype}} = \text{intercept} + \beta_1 \ln(\text{ProductPrice})_{\text{market/quarter/storetype}} + \beta_2 \text{SFA-index}_{\text{market/quarter}} + \beta_3 \text{Year} + \beta_4 \text{Quarter} + \beta_5 (\text{Market-StoreDummy}) + \beta_6 (\text{CigarettePrice})_{\text{market/quarter/storetype}} + \text{error}$$

Results - NRT Products

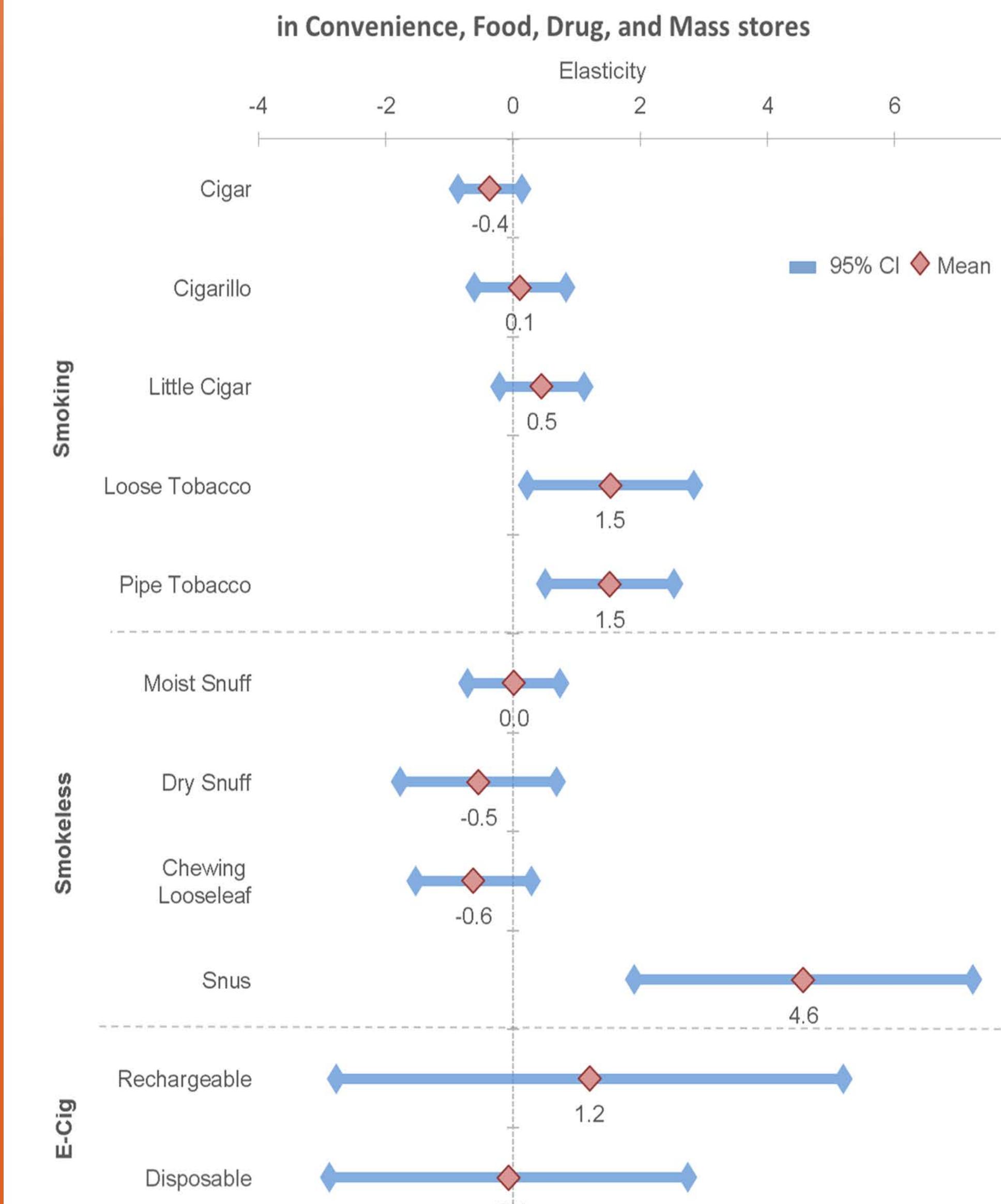


Results

Combustibles, Smokeless, and Electronic Cigarettes



Estimates of Cross Price Elasticity between Cigarettes and Other Tobacco Products



Implications for State and Community Tobacco Control

The own price elasticities for tobacco products are in general negative and statistically significant, with many tobacco products having elastic demand, indicating that the sales of tobacco products are sensitive to own price changes. It suggests that state and local policies that affect the retail prices of tobacco products can influence the demand for tobacco products, and the impact may be particularly large for some tobacco products such as combustible tobacco products and electronic cigarettes.

Positive and significant cross-price elasticity of loose tobacco, pipe tobacco, snus, NRT patch, and dissolvable lozenges shows that those products are substitutes to cigarettes and their sales tend to be higher as prices of cigarettes increase.

Conclusions

There were considerable variations in the own and cross price elasticities across other tobacco product categories.

Policies increasing the retail prices of these tobacco products could lead to reduction in the sales of these tobacco products.

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