

# How tax incidence varies over space: The case of alcohol tax reform in Belgium

Jean Hindriks, Valerio Serse 19 April 2019

*Alcohol tax pass-through can vary substantially across products, but it also depends on the location of stores. This column examines retail prices of six major brands of spirits in Belgium after a tax reform, and finds evidence that the impact on prices varied across regions. These variations depended on the intensity of local competition and, to a lesser extent, proximity to national borders.*



**Jean Hindriks**

Professor of Economics,  
Université catholique de Louvain



**Valerio Serse**

PhD student in Economics,  
Université catholique de Louvain



When making alcohol control policy, it is important that we understand tax-shifting for alcoholic beverages. Most papers that analyse the effectiveness of alcohol taxes rely on the effect of tax on consumer prices (Wagenaar et al. 2009). The existing evidence suggests that alcohol taxes are effective in increasing the price of alcoholic beverages, as they are mostly over-shifted, but has been shown that the tax-shifting is heterogeneous across products.

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Kenkel (2005) studied an alcohol tax rise in Alaska in 2002 and found that the pass-through ranged between 167% and 213% for six major brands of distilled spirit. Ally et al. (2014) estimate the pass-through of excise duties and VAT in the UK between 2008 and 2011. They found evidence of tax over-shifting for spirits on average, but also significant under-shifting for the cheapest brands.

This evidence highlights how complex it is to design 'sin taxes' aimed at improving public health. As price rises tend to differ within the same category of taxed products, the risk is that we simply shift demand from high-price to low-price products. There is increasing concern about both the substitution effect towards other taxed goods, and how taxes impact different types of consumers.

There is another concern for alcohol control policy: the spatial heterogeneity in the tax pass-through. Although spatial heterogeneity can be theoretically explained by differences in price elasticities of demand and market structure over space (Hindriks and Myles 2013), there has been little empirical research published about this spatial variation.

Recent studies have shown that proximity to low-tax jurisdictions can reduce tax-shifting to cigarettes (Harding et al. 2012) and soda prices (Cawley and Frisvold 2017), because consumers can cross the border to shop. Evidence also suggests that tax pass-through to gasoline retail prices decreases with the proximity to the border and increases with the local brand concentration (Doyle and Samphantharak 2008).

Our recent research (Hindriks and Serse 2019) extends this analysis by studying the spatial heterogeneity in alcohol tax incidence for homogeneous products. In particular, we focused on two possible determinants of heterogeneity:

- variation in the scope for cross-border shopping,
- variation in the local intensity of competition at the retail store level.

## The Belgian alcohol tax reform

On 1 November 2015, the Belgian government increased the excise tax on alcoholic beverages. For 70 cl bottles of spirits containing 40% of alcohol, the tax change was equivalent to €2.43 per bottle. This tax was criticised in the media for reducing sales while failing to generate extra revenue. Total revenue from excise taxes on alcohol was €318 million in 2015, €323 million in 2016, and €319 million in 2017.

One survey of 425 local retailers conducted in early 2016 by the SNI (Syndicat Neutre des dépendants) suggests that volume sales declined by 14% and shop thefts increased by 11% year-

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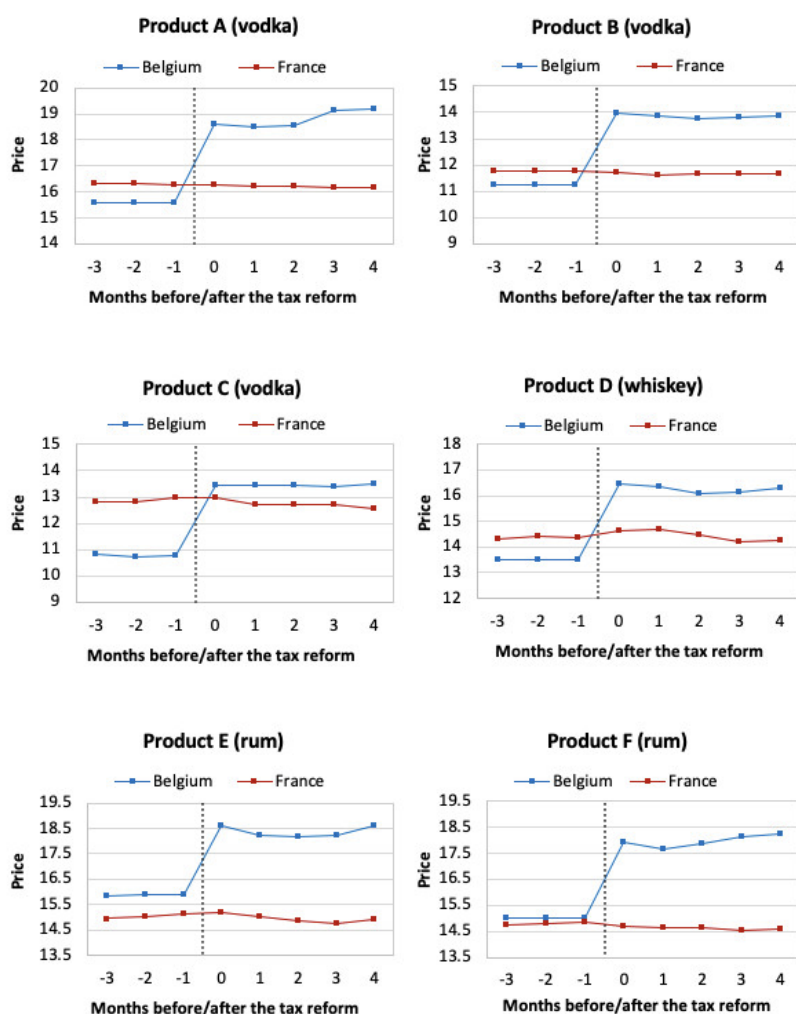
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on-year. The tax reform increased the price of spirits in Belgium relative to those in neighbouring countries, and the Belgian federation of spirits and wine (Vinum et Spiritus) blamed cross-border shopping for lost sales.

We exploit this tax reform to estimate alcohol excise tax pass-through to the (posted) retail price of six major brands of spirits in Belgium, using a difference-in-differences method. The estimation was based on a balanced panel of scanner data from a supermarket chain that has 33% market share. As a control, we used the retail prices of the same brands when sold in France by the same supermarket chain. This control group was not contaminated by the tax change, because the French stores in the we surveyed were all located far away from the Belgian border.

Many studies use scanning data, but that is conditional on purchase, so we used posted prices instead. Figure 1 shows the evolution of the monthly price of spirits in both Belgian and French stores three months before the tax reform, and four months afterwards. In line with previous research, the tax was significantly over-shifted for all spirits during the first month of tax reform.

**Figure 1** Evolution of spirit prices in Belgium and France, following the 2015 Belgian tax reform



Source: Hindriks and Serse (2019)

## How tax incidence varies over space

We could also test for spatial variations in the tax pass-through for each brand of spirits. Figure 2 shows geographical differences in tax incidence at the municipality level for each product. As shown in the figure, tax-shifting for homogeneous products is different in different regions of Belgium. Over-shifting is in red, and under-shifting is in blue.

**Figure 2** Spatial heterogeneity in alcohol tax incidence following the 2015 Belgian tax reform

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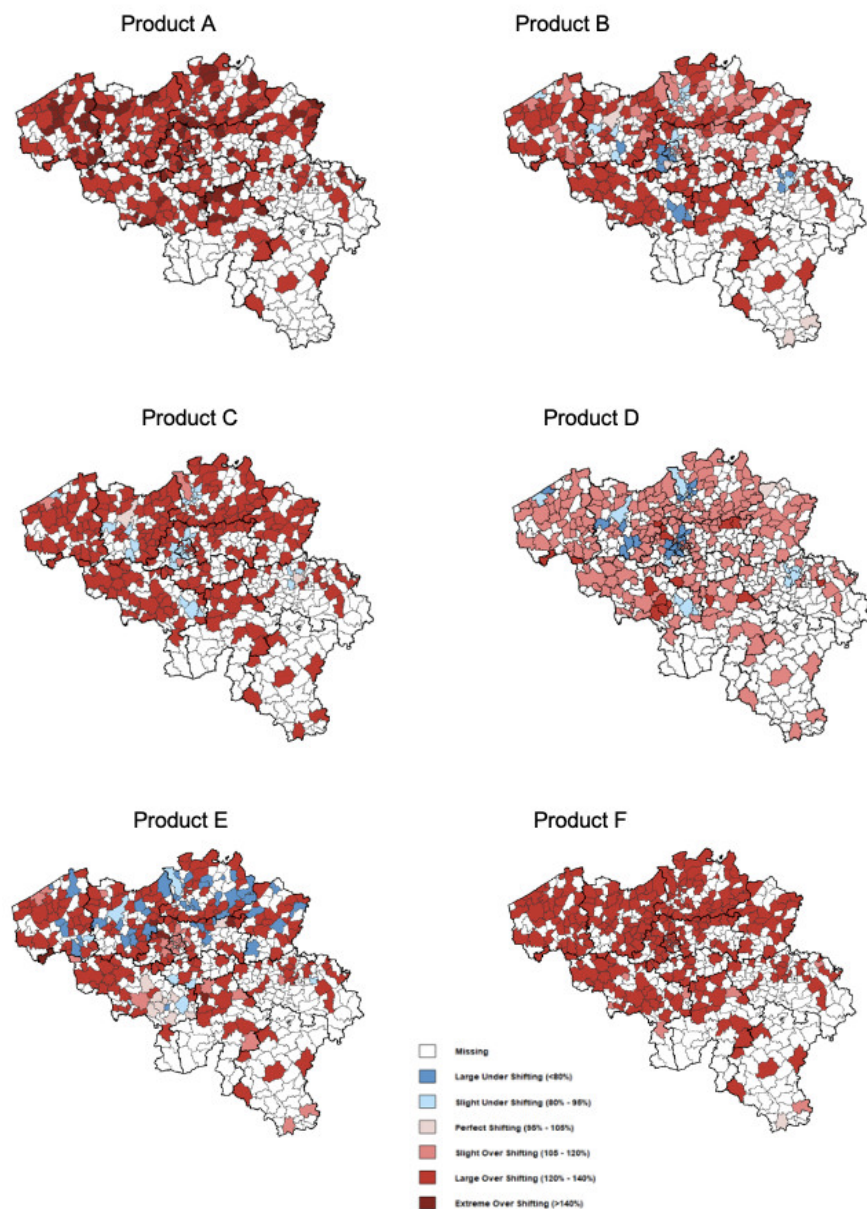
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Source: Hindriks and Serse (2019)

We re-ran our difference-in-differences model accounting for spatial heterogeneity in demand-side characteristics and supply-side conditions, to explain these differences in tax-shifting. The variations were strongly related to the intensity of local competition and, to a lesser extent, to the scope for cross-border shopping. In particular, the higher the number of competing retailers in a given area, the lower the tax pass-through to spirit prices. On the other hand, proximity to the French, Dutch and German border did not seem to affect the tax shifting – even though the tax reform increased the relative price of Belgian spirits with respect to these countries.

There was lower tax-shifting for some products in stores close to Luxembourg, which had the lowest spirit prices both before and after the tax reform. This indicates that, at least in the short run, stores tended to be more sensitive to domestic than foreign competition as long as the price gap with the neighbouring country was not too large.

Interestingly, both border and competition effects are 'back-loaded' – i.e. they appear a few months after the reform. This suggests that it took some time before stores adjusted their prices to reflect foreign and domestic competition.

### Implications for alcohol control policy

These findings suggest that the health benefits of an alcohol tax reform may vary considerably. They depend on what alcohol the consumers buy, but also on where they live. The tax burden tends to fall more on consumers in rural areas, where retailers can act as local monopolist. In urban areas, retailers are more likely to bear the burden of alcohol taxes due to a more intense competition.

A similar effect occurs when there are low-tax jurisdictions nearby, because consumers can easily cross the line and buy alcohol abroad. In Belgium, 50% of the population live less than 50 km from a border. We found evidence of spatial variation in the volume of sales across Belgium, evidence of spirit stockpiling before the tax reform – but also a substantial rise of spirit sales in Luxembourg, suggesting levels of cross-border shopping that might worry policymakers.

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