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Demand and distance: Evidence on cross-border shopping

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Abstract

An important issue for commodity taxation is the extent to which changes in foreign taxes affect the extent of cross-border shopping and thereby, domestic tax revenue. We use data from Swedish municipalities to estimate how responsive alcohol sales are to foreign prices, and relate the sensitivity to the location's distance to the border. Typical results suggest that the elasticity with respect to the foreign price is around 0.3 in the border region; moving 150 (400) km inland reduces the cross-price elasticity to 0.2 (0.1). Our estimates suggest that a recent Danish cut in the spirits tax reduced Swedish tax revenues from spirits sales by more than 2%, and that an attempt by Sweden to cut taxes in response would reduce tax revenues further.

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1. Introduction

That prices of many goods differ considerably across countries is well documented.[1] What we know much less about, however, is to what extent consumers actually take advantage of these

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[1] See, for instance Engel and Rogers (1996), Goldberg and Knetter (1997), Haskel and Wolf (2001), Anderson and Van Wincoop (2004), and Goldberg and Verboven (2005).

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price differentials and engage in cross-border arbitrage. To provide evidence on this, we examine the responsiveness of alcohol sales in Swedish communities to foreign prices, and relate the price sensitivity to the distance of a location to the border.

With the deeper integration of the European Union (EU) and its expansion, the effects of cross-border trade have become an important policy issue, since the price differences are, in many cases, due to taxes set by individual member states. The resulting price differentials may be so great that consumers in high-tax countries make their purchases elsewhere, with important consequences for tax revenues. In fact, it is sometimes argued that countries "compete" by lowering taxes to attract foreign demand, leading to an equilibrium with taxes at a lower level than if countries had been able to coordinate; see, for instance, Kanbur and Keen (1993).[2] These issues figure prominently in the ongoing debate on tax harmonization within the EU and can be illustrated with the following quote from a press release regarding taxes on alcohol.[3]

> The Commission concludes that more convergence of the rates of excise duty [on alcohol] in the different Member States is needed so as to reduce distortions of competition and fraud. However, given the widely differing views in the Member States about the appropriate levels of the minimum rates, and given that any change would require unanimous agreement, the Commission is not making a proposal at this time. Instead the Commission wishes to launch a broad debate in the Council, the European Parliament,… (Press release May 26, 2004).

A key problem in this debate is that little is known about the magnitude of cross-border shopping, see Keen (2002) for a discussion. Interview studies indicate that the effects might be substantial. Frequently cited work by FitzGerald (1992), for instance, reports that in 1986, about 25% of the spirits consumed in the Republic of Ireland were bought in Northern Ireland. Campbell and Lapham (2004) examine links between the number of firms along the Canada–US border and the real exchange rate. They find that when prices in the US fall relative to prices in Canada (a real exchange rate depreciation), there is a significant increase in the number of sellers and/or in the average employment on the US side of the border for the four sectors they study (food stores, gasoline service stations, drinking and eating places). Their findings are thus consistent with substantial changes in demand as a result of relative price changes and therefore, with substantial cross-border flows. However, based on an interview study by Ford (1992), they argue that for the industries in question, the effects of cross-border shopping are confined to border counties. Goldberg and Verboven (2005) report that, despite persistent price differences, cross-border shopping of automobiles in Europe is limited. There also exist some papers examining spillover effects of different sales taxes across US states (see e.g. Fox, 1986; Walsh

[2] Theoretical work using a game theoretic framework was pioneered by Mintz and Tulkens (1986). Kanbur and Keen (1993) examine a tax setting game between two governments. In their model, consumers incur a transport cost to shop in the other country such that the closer to the border they live, the less costly it is to go shopping abroad. In their analysis, a less densely populated country will set the lower tax rate since it has relatively less to lose from reducing taxes. Wang (1999) shows that this result from Kanbur and Keen is further strengthened if the large country decides on its tax first. Nielsen (2001) lets countries differ in size rather than in population density, and similarly finds that the smaller country sets the lower tax rate; see Keen (2002) for a survey.

[3] Some recent cuts in alcohol taxation by Denmark and Finland were prompted by concerns about cross-border shopping from Germany and Estonia, respectively. This, in turn, caused Sweden to consider the effects of reducing its taxes to limit the price differential to neighboring Denmark and Finland (SOU, 2004). In October 2004, Britain was sued by the European Commission on claims that it tried to prevent high volume cross-border shoppers of alcohol in a way that is inconsistent with the common market.