



## Commodity taxation and parallel imports

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### ABSTRACT

We examine the interaction between commodity taxes and parallel imports in a two-country model with imperfect competition. While governments determine non-cooperatively their commodity tax rate, the volume of parallel imports is determined endogenously by the retailing sector. We compare the positive and normative implications of having commodity taxes based on destination or origin principle. We show that, as the volume of parallel imports increases, non-cooperative origin taxes converge, while destination taxes diverge. Moreover, origin taxes are more similar and lead to higher aggregate welfare levels than destination taxes.

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### 1. Introduction

This paper examines the interaction between commodity taxes and parallel imports in a two-country model of imperfect competition. The main issue investigated is whether an increased volume of parallel imports – for many, a synonym of market integration – leads to a tax convergence or not. The paper shows that parallel imports do induce a tax convergence if taxes are based on the origin principle, and to a tax divergence if taxes are based on the destination principle. In our model, all this happens along with the fact that origin taxes lead to narrower rates and to unambiguously higher aggregate welfare than destination taxes.

Parallel imports are legal and highly encouraged within the European Union (EU).<sup>1</sup> To achieve this, the EU has adopted a *regional* exhaustion rule of intellectual property rights. This rule implies that if an EU producer chooses to export within the EU by using local retailers, these retailers can legally re-export the good. The European Court has repeatedly ruled in favour of parallel imports, arguing that

they intensify competition and lead to deeper market integration.<sup>2</sup> Recent empirical analyses of the extent of parallel imports within the EU document the importance of these flows.<sup>3</sup>

The existence of parallel imports implies the existence of price differentials. These price differentials may exist for several reasons. Consumer's willingness to pay across countries for instance may differ whether due to tastes or income. This typically induces imperfectly competitive firms to engage in third-degree price discrimination and thus to charge different prices across countries (see [Malueg and Schwartz, 1994](#)). Prices may also differ, not because the markets are different but because the realization of demands is different across markets. [Raff and Schmitt \(2007\)](#) develop a model where producers and consumers may benefit from parallel imports when retailers must place orders before they learn about the intensity of the demand in their respective market. A third reason is government policies and regulations, such as price ceilings on pharmaceutical products (see [Kanavos](#)

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<sup>1</sup> Parallel imports, also known as grey products, are genuine products sold in a country without the authorization of the intellectual property right owner. See [Maskus \(2000\)](#) for a general discussion.

<sup>2</sup> For example, see the European Commission's decision on the case of Glaxo Wellcome et al. ([Official Journal, 2001](#)), and on JCB ([Official Journal, 2002](#)) where a 39million EUR penalty was imposed for attempting to stop parallel imports.

<sup>3</sup> For instance, [NERA \(1999\)](#) reports that for CDs, consumer electronics, auto spare parts, cosmetics, and soft drinks, 5–20% of trade within EU are parallel imports; [Ganslandt and Maskus \(2004\)](#) report that, for some brand names in the pharmaceutical sector, the share of parallel imports reaches 50% in Sweden. Additional estimates can be found in [OECD \(2002\)](#), [Ahmadi and Yang \(2000\)](#), and [Kanavos and Costa-Font \(2005\)](#).

and Costa-Font, 2005; Grossmann and Lai, 2008). The present paper fits within this last category of papers, where government policies affect parallel imports, but it turns its attention to *commodity taxes*.

Commodity taxes are important revenue-generating instruments in the EU countries. Different tax rates may naturally lead to different consumer prices giving arbitrage opportunities to parallel importers. In turn, parallel imports may affect the choice of these taxes. This simultaneous endogeneity of parallel imports and commodity taxes makes the analysis interesting.

Our reference point is the commodity tax competition literature (see Lockwood, 2001 for a survey). In this literature, it is usually assumed that markets are fully integrated so that the law-of-one-price applies and parallel imports never arise. This literature then focuses on two issues: (i) whether the imposition of tax harmonization, i.e. forcing countries to adopt the same tax, leads to efficiency gains or not, and (ii) which tax regime is best – the destination or the origin tax regime.<sup>4</sup>

Our starting point, however, is somewhat different. We assume that markets are segmented and that the equilibrium is characterized by price differentials that parallel importers exploit given some transaction costs. The policy initiative is to reduce these transaction costs and thus to promote market integration.<sup>5</sup> Parallel imports then affect retail prices and the taxes set by the governments. In turn, these new prices and taxes affect parallel imports, and so on until a new equilibrium is reached.

Within this setup we ask a novel question: *does promoting parallel imports bring tax convergence?* Our motive should be clear: while repeated calls for tax harmonization in the EU have had little success, we investigate whether a more ‘market-oriented’ initiative can bring about a tax convergence through the ‘back-door’. Indeed, implementing market integration through parallel imports is arguably more ‘market-oriented’, and maybe simpler than asking member countries to harmonize their taxes. Needless to say, such a tax convergence is desirable only if it leads to Pareto efficiency gains, an issue that we also investigate in detail.

To analyze the interaction between commodity taxes and parallel imports, we adopt Maskus and Chen (2002, 2004)’s model of parallel imports.<sup>6</sup> This model has the advantage of providing an explicit level of parallel imports and of explaining parallel imports as a by-product of vertical control issues associated with retailing activities. In particular the model assumes a single good monopolist that sells in two countries. In the home country, the manufacturer sells directly to consumers and, in the foreign country, it sells through a retailer. This vertical separation in the foreign country creates a negative externality, viz. the so-called double marginalization problem (see Tirole, 1988), where the existence of two successive mark-ups – one by the producer and one by the retailer – leads to a higher price and lower sales than in an integrated structure. A well-known solution to this problem is a two-part pricing strategy, viz. a wholesale price equal to the marginal cost of production and a fixed fee that captures the retailer’s rent. However, faced with a low wholesale price, the foreign retailer may find it profitable to engage in parallel imports and sell part of its order to the manufacturer’s home country. Thus, in trying to avoid double marginalization, the manufacturer may induce more competition in its home market (from monopoly to duopoly) and lowers its overall profit. The manufacturer chooses a two-part tariff contract that balances these two opposite forces.<sup>7</sup>

<sup>4</sup> While most papers in this literature focus on one of the two issues, few papers analyze simultaneously the two of them, see Keen et al. (2002) and Behrens et al. (2007).

<sup>5</sup> One could interpret the consistent rulings of the European Court as steps needed to reduce transactions costs faced by parallel importers.

<sup>6</sup> In Maskus and Chen (2005), Li and Maskus (2006), and Ganslandt and Maskus (2007), the basic model is extended in several directions without altering its fundamental properties.

<sup>7</sup> In this model parallel imports are thus not necessarily a good thing – on the one hand they improve efficiency by creating competition, while on the other hand they reduce efficiency by creating double marginalization. Such a rich setup is ideal for addressing our central theme, viz. how parallel imports affect decentralised tax setting.

We augment this model with taxes that governments choose in a non-cooperative way. We then examine the implications of two different tax systems: *destination*-based taxes – where taxes are set and collected by the authorities of the country where the good is purchased and consumed (the current EU system) – and *origin*-based taxes – where taxes are set and collected by the authorities of the country where the good is produced (a proposed EU system). We then investigate the effects of a reduction of the transaction cost specific to parallel imports on the equilibrium variables and we show three main results. First, the equilibrium tax rates in the two countries are more similar under origin taxation than under destination taxation. Second, given parallel trade, origin-based tax rates converge as the volume of parallel trade increases, whereas destination-based taxes diverge. Third, origin-based taxes lead in general to higher welfare in both countries than destination-based taxes. Thus, market integration can indeed bring both tax convergence and higher welfare when taxes are origin-based.<sup>8</sup>

Three recent papers have looked at commodity taxation issues in segmented markets. Haufler et al. (2005) use a symmetric reciprocal-dumping trade model to examine how trade cost reductions affect the choice of commodity tax base. They show that, while origin taxes still outperform destination taxes when trade costs are low, the opposite is true when they are high. Haufler and Pflüger (2007) add government revenue requirements to the same reciprocal-dumping model and re-examine the comparison between destination and origin taxes. They show that ambiguity emerges in many of the earlier results. Finally, Behrens et al. (2007) examine how tax (origin- and destination-based) harmonization affects firm location. They use a general equilibrium model with monopolistic competition that allows for variable mark-ups and market segmentation. A main result of their analysis is that countries do not agree on a common tax regime – as firms agglomerate into the large country, this country prefers origin-based taxes while the smaller country prefers destination-based taxes. However, while their analysis introduces the interesting aspect of asymmetry in the location of production, it does not take into account the fact that commodity taxes also adjust to that asymmetry.

Our paper keeps firm location fixed as in Haufler et al. (2005) but allows for asymmetries in the location of production as in Behrens et al. (2007). Like Haufler et al. (2005), we look at how market integration affects the non-cooperative choice of origin and destination-based taxes, but we use a different trade model than theirs; one where vertical links and parallel imports play a key role. We perform our analysis around of what we think is a novel research question (*‘does market integration lead to tax convergence?’*) and we show some interesting new results (converging origin taxes are generally better than the diverging destination taxes). Thus, our simple model shows no ambiguity about which tax base is best (an ambiguity that exists in Haufler et al., 2005) and no conflict between countries on the choice of a common tax regime (a conflict that exists in Behrens et al., 2007).

We should emphasize that the structure of our model does not allow us to claim generality of our results. We work with linear demand and specific commodity taxes (as the rest of the literature on commodity taxes and imperfect competition) acknowledging that alternative assumptions may lead to different results. In that sense, the model examined here is an example. Nevertheless, our results are robust to a large range of parameters, and we identify mechanisms that are novel to the issues.

The paper is organized as follows. Section 2 develops the model and examines the case where taxes are set according to the

<sup>8</sup> In this sense, we confirm the result that Keen and Lahiri (1993, 1998) derive, viz. that within models of imperfect competition, origin taxation is better than destination taxation. However, we do that in a model with vertical separation and market segmentation, while they analyze fully integrated horizontal markets. In addition, we show that the origin tax superiority does not conflict with a tax harmonization plan that a supranational authority may have. In our model, origin taxation and tax convergence go together (a result which is not true in the fully integrated horizontal markets model; see e.g. Keen et al., 2002).

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