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On the Possibility and Desirability  
of Taxing E-Commerce

Bo Sandemann Rasmussen

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# On the Possibility and Desirability of Taxing E-Commerce\*

Bo Sandemann Rasmussen<sup>†</sup>

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## Abstract

Over the past decade the taxation of e-commerce has been widely discussed among politicians, tax law experts and economists. To put some perspective on this issue it is analyzed to what extent e-commerce can actually be taxed and the severity of the ensuing tax revenue losses following from future growth of e-commerce is discussed. Since the US and the EU cases differ substantially they are considered separately. Subsequently various arguments supporting the view that e-commerce should receive preferential tax treatment are considered. Although no firm recommendations can be provided some interesting topics for future research are suggested.

*Keywords:* E-commerce, commodity taxation, tax principles, revenue loss, preferential tax treatment, auditing.

*JEL:* H25, L12, F13.

## 1 Introduction

Over the past decade the taxation of e-commerce has been widely discussed among politicians, legal tax experts and economists. On the one hand concerns have been raised that unless online trade is subjected to the same

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tax rules as traditional retail trade taking place through bricks-and-mortar shops, governments stand to lose tax revenue at an increasing scale.<sup>1</sup> Thus, policies aimed at "leveling the playing field" between online trade and traditional retail trade - by effectively taxing online trade along the same lines as traditional retail trade - will reduce the fears of substantial revenue losses, at least to the extent it is technically feasible to enforce taxes on goods bought online.<sup>2</sup> This view also supports the tax neutrality principle that no particular form of trade should be favoured through the tax system (see Nellen (2001) and Varian (2001)). On the other hand it has been argued that the e-commerce business is an emerging industry and that taxing online activities would discourage its future development; therefore, at least a moratorium on e-commerce taxes would be recommendable (as in the Internet Tax Freedom Act enacted in 1998 in the US, see Goolsbee and Zittrain (1999)). Another possible reason for granting tax preferences to e-commerce could be the existence of some form of positive network externalities associated with e-commerce. However, considering the strength of these possible externalities especially Zodrow (2003) but also Varian (2001) seem to dismiss this argument. If a case for preferential tax treatment should be based on the existence of network externalities it is most likely that internet access fees should be made tax exempt since it is the access to the internet that generates the most direct externality effects on other users.

Thus, no consensus exists as to what extent e-commerce should be made subject to taxation. Therefore, it seems worthwhile to go through the arguments for and against taxation of e-commerce in a systematic way, to get an idea where future research should be directed in order to provide proper guidance for policy-makers on this important issue.

The first issue to be dealt with is to what extent e-commerce can be taxed. It will not be useful to discuss the desirability of taxing e-commerce if it is simply not possible (or administratively prohibitively expensive) to do so. The administrative procedures necessary for taxing e-commerce are also considered. Subsequently it is discussed to what extent policy-makers and tax collectors should fear substantial revenue losses from a growing proportion of

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<sup>1</sup>There is no consensus regarding the exact scale of the projected revenue losses from online trade being untaxed. Goolsbee and Zittrain (1999) project that the revenue loss in the US from not subjecting e-commerce to state sales taxes was next to nothing in 1998. However, given the projected increase in e-commerce the revenue losses could become substantial in the near future, being an estimated 10% of total sales tax revenue by 2007. Others, e.g. GAO (2000), projects that the revenue losses are somewhat higher, being 5% already in 2003 (estimated in year 2000).

<sup>2</sup>This could be especially difficult for digital goods where it may be impossible to verify that a transaction has taken place. For physical goods verification will generally be easier to establish, see section 2 for further details.

consumption being made up of goods purchased through the internet. Given that at least part of the goods sold through the internet can be made subject to effective taxation the next issue to be considered is to what extent it is socially desirable to tax e-commerce at the same rate as goods being sold through traditional retail trade, or whether some degree of preferential tax treatment of e-commerce is called for. Since the taxation of e-commerce is a relatively new research area there are lots of potentially important questions to be answered before a definite conclusion can be reached on this topic.

The remaining part of the paper will be structured as follows. Section 2 deals with the taxability of e-commerce while section 3 discusses how likely substantial revenue losses are to emerge from a growing amount of e-commerce. Section 4 discusses various arguments from the literature that may favour granting preferential tax treatment to e-commerce. In section 5 some new arguments for granting preferential tax treatment are briefly discussed, and some relevant items for a research agenda on the taxation of e-commerce are presented. Section 6 concludes.

## 2 Is E-Commerce Taxable?

Taxation of any economic transaction requires that it can be legally verified that a transaction between the buyer and the seller has taken place, implying that the administrative procedures needed to generate the required verification are important. Verification can either be direct - e.g. through observation of the transaction by a representative of the tax authorities - or indirect - e.g. through auditing of the parties involved in the transaction. In most cases direct verification would be prohibitively costly<sup>3</sup> making indirect verification through auditing the commonly used method in modern societies. Since auditing of firms takes place for other reasons than for raising tax revenue from commodity taxation the marginal cost of generating the sufficient information for levying commodity taxes through auditing of firms is negligible. Auditing of households for tax purposes may be effective in establishing how much income is earned, but ineffective in establishing the consumption levels of specific goods. This aspect is especially evident in the US where the compliance rates for household use taxes are next to nothing (see e.g. Varian (2001) and section 3.1 below). This implies that whenever verification can be obtained either through auditing of firms or through auditing of households it will be most efficient to let auditing of firms generate the required

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<sup>3</sup>In the sense that the cost of verification in most cases would exceed the tax revenue generated. An exception to this rule is the direct verification being possible in international trade through customs control.

information. In some cases, however, verification must take place through registration of the actions of the buyer. To what extent this is practically possible (or economically feasible) very much depends on the type of good being traded - in particular whether it is a digitalized<sup>4</sup> or a physical good. In any case some form of direct verification will be needed.

Since e-commerce transcends national boundaries it will often be the case that seller and buyer belong to different tax jurisdictions<sup>5</sup> in which case it must be considered which tax principle applies. For commodity taxation two main inter-tax-jurisdictional principles exist, the destination principle and the origin principle (see Frenkel *et al.* (1991)). According to the destination principle it is the destination of the final consumption of the good that determines the size of the tax so that all consumption taking place within the tax jurisdiction is taxed at the same rate. Hence, under the destination principle exports of goods are untaxed while imports are tax at the same rate as goods produced and sold domestically. Under the origin (or the source) principle it is the origin of the commodity, i.e. the location of the seller, that determines the size of the tax so that all goods produced within the tax jurisdiction are taxed at the same rate irrespectively of the final destination of the good. Hence, according to the origin principle exports are taxed at the same rate as goods produced and sold domestically while imports are untaxed. Of course, for transactions between sellers and buyers belonging to the same tax jurisdiction the tax liability will be independent of the tax principle.

The choice of tax principle will affect the administrative procedures needed to generate the required verification. Since the tax authorities can only audit entities within their own jurisdiction application of the origin principle implies that auditing of firms will generate the required verification. However, when the destination principle applies the seller will be located outside the jurisdiction of the tax authorities levying the tax and alternative methods for obtaining verification are needed. To describe these methods in detail it is convenient to treat the cases of digitalized goods and physical goods

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<sup>4</sup>By digitalized goods are meant goods that can be fully transferred electronically between the seller and the buyer through the internet. Hence, goods that just contain digital material like CDs and DVDs are not considered to be "digital" in this context since the delivery of the good requires a physical transaction when the CD or the DVD is delivered to the buyer. Of course, if the buyer is willing to download the digitalized content of the CD or the DVD and burn his own disc the good becomes a digital good (but for many people that good will not be a perfect substitute for the "original" CD/DVD that includes cover material etc.).

<sup>5</sup>The most notable case being international trade. Existence of local commodity taxation within a country, like local and state sales taxes in the US, is another important case.

separately.

## 2.1 The Case of Digitalized Goods

For digitalized goods the verification of a transaction is particularly difficult due to the anonymity provided by the internet. If the origin principle applies - or when the seller and buyer belong to the same tax jurisdiction - verification should be obtained through auditing of the seller. The problem is here that due to digital goods being non-rival goods where the sale of one unit of a digital good (e.g. a computer program) does not reduce the potential for selling the same good to another customer, the same good can be sold an unlimited number of times and the problem of the tax authorities becomes one of establishing how many transactions have taken place. Auditing of the cost side of the selling firm will not yield the required information whereas auditing of the financial transactions of the seller, basically going through all payments made into the accounts of the seller, could provide the required information. That could prove to be quite a big task and even though the required verification could be provided this way the costs to the tax authorities might be regarded as excessive. In this case origin taxation of e-commerce in digitalized goods will not generate a lot of revenue as firms will expect the tax authorities to be unwilling to devote the resources required for effective auditing.

Under the destination principle the tax authorities will have to establish verification through information gathered from the buyers. Two options could be possible. Either by verifying the transaction through establishing that the digitalized good (computer program, mp3-file etc.) has been transferred onto the computer of the buyer through the internet, or by verifying that a payment has taken place e.g. through a credit card payment. Regarding the first option it could be argued that from a technical point view such evidence could be extracted from the computers or the networks involved in the transaction. Specialist computer forensics firms are capable of establishing the history of a computer even if the user of the computer should attempt to erase any evidence of the transaction having taken place. The relevant observation is, however, that such verification would be extremely costly and given the likely size of the tax burden to be imposed on the transaction through this verification, the costs would be considered to be prohibitively high. The second option could be viable provided the tax authorities can get the information needed from the credit card companies. Against this goes that adoption of anonymous payment mediums will render this option ineffective. It may be then that destination taxation is even more ineffective than origin taxation in generating tax revenue from e-commerce in digitalized

goods.

Summing up, transactions involving purely digitalized goods should be expected to generate very little tax revenue no matter what tax principle is applied. Thus, e-commerce in digitalized goods should for all practical purposes be considered untaxable<sup>6</sup> implying that if e-commerce in digital goods substitutes for trade in commodities that are subject to taxation, the revenue of the tax authorities may be in jeopardy.

## 2.2 The Case of Physical Goods

Since physical goods either can be sold through the conventional retail trade channel or through the internet a comparison of the tax aspects for the two types of trade may be informative. A typical aspect of conventional retail trade is that the seller and buyer belong to the same tax jurisdiction,<sup>7</sup> implying that the tax principle employed is unimportant. As we have argued earlier auditing of firms is much more effective than auditing of households implying that it will be most efficient to obtain the verification needed for tax purposes through auditing of firms. As a practical matter the seller is usually required to collect the tax on behalf of the tax authorities.

For e-commerce the seller and buyer may typically reside in different tax jurisdictions<sup>8</sup> implying that the choice of tax principle becomes important.<sup>9</sup>

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<sup>6</sup>Notice, however, that this statement is made conditional on the current state of technology. It is quite likely that future generations of the internet will allow proper identification of agents participating in a given transaction at a much lower cost and thereby prevent the anonymity the current technology offers. If such technology becomes available in the future the distinction between digital goods and physical goods will become much less important from a taxation point of view, and much of our discussion of taxation of e-commerce in physical goods will become relevant for e-trade in digital goods. Notice also, that the latest EU directive regarding taxation of "electronically supplied services" (EU 2002) basically requires all trade in digital goods to be taxed (according to the destination principle) even when the selling firm is located outside the EU. The idea is that the seller is supposed to pay the relevant VAT to the tax authorities where the buyer has residence. All firms have to register with the tax authorities in all the countries they do business in and must comply with the tax laws of these countries. One could suspect that compliance with respect to the taxation of such transactions from small foreign firms selling computer programs, mp3-files etc. to European customers will be far from perfect.

<sup>7</sup>Two caveats apply here: Cross-border shopping and shopping made by tourists and travellers from other tax jurisdictions. To keep complications to a minimum we will disregard both aspects here.

<sup>8</sup>One of the incentives for firms to engage in e-commerce is to expand the mass of potential buyers. Hence, unless tax jurisdictions are "large" in either a geographical or in an economic sense it is quite likely that a major part of the demand will emanate from e-shoppers from outside the tax jurisdiction of the firm.

<sup>9</sup>It is assumed that all tax jurisdictions apply the same tax principle. For a discus-



For e-commerce in physical goods under origin taxation nothing is really different from the case of conventional trade. Of course, an explicit definition of what determines the location of the seller needs to be stated in this case. It could either be the physical location of the server servicing the website of the seller, or the physical location of the storage and shipping facilities actually handling the shipments of the goods sold to the final customers. To make verification of location as easy as possible it would probably be preferable to use the physical location of the storage and shipping facilities as defining the location of the seller. Just as with ordinary retail trade auditing of the cost side of firms will be effective in establishing the required verification. Physical goods are rival goods where the sale of one unit of the good prevents the seller from selling the same good to another customer. Hence, effective auditing of the resource use of firms will make it possible for the tax authorities to tax the transaction no matter whether the good is sold through a bricks-and-mortar retail store or through an internet-based store. Notice that it is the effective auditing of firms selling physical goods that makes such goods taxable. It does not matter for the taxability how the good is delivered to the buyer e.g. whether the buyer collects it in the store or the good is delivered by a courier. In neither case is a representative of the tax authorities present to verify that the transaction has taken place. Verification is obtained indirectly through effective auditing. Collection of the tax will in both cases be taken care of by the seller.

Use of the destination principle for e-commerce requires that the transaction can be verified in relation to the acquisition of the good by the buyer. The important property of physical goods compared to digitalized goods is that they have to be delivered physically to the buyer making the point of delivery an obvious possibility for verification of the transaction. How the verification should take place would - *inter alia* - depend on whether or not the tax jurisdiction of the buyer has customs control. With an effective customs control direct verification is possible as the good passes through the customs control. Without customs control indirect verification is still possible since the physical good has to be handed over to the buyer by a courier. By auditing the courier firm<sup>10</sup> the required verification can be established implying that it should be possible to use destination taxation of e-commerce in physical goods.

There are, however, some more practical matters that have to be considered mainly with respect to the administrative procedures used to make sure

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sion of some of the problems with application of different tax principles in the two tax jurisdictions, see section 2.3 below.

<sup>10</sup>Notice that even though the tax authorities cannot audit the foreign seller the courier is operating within its tax jurisdiction and can therefore be subjected to auditing.

that the right tax liability is levied on and collected from a given transaction. These administrative procedures are important as they affect the incentives of both firms and households to participate in the e-commerce market. For firms it is important how much of the tax collection (on behalf of "foreign" tax authorities) they are required to be involved with since unduly complicated administrative procedures will be considered an additional cost for firms participating in e-commerce. For households the administrative procedures may affect the degree of uncertainty related to trading with (more or less) anonymous sellers on the internet, and if some procedures increase the perceived level of uncertainty this will discourage households from using e-commerce.

For the administrative procedures at least three options are available. First, the selling firm could calculate, collect and forward the tax on a given transaction based on the tax rate prevailing in the tax jurisdiction of the buyer for that kind of commodity. This would create full certainty for the consumer regarding the total price of the good purchased, including tax and shipping costs, at the point in time when the purchase is made. Such a procedure would, on the other hand, impose substantial administrative burdens on firms by effectively requiring them to register with the tax authorities in all the tax jurisdictions (countries) they do trade with.<sup>11</sup> A second possibility would be still to have the selling firm calculating the tax but to have the courier handling the shipment of the good collecting the tax revenue from the consumer when the good is delivered. This would still require extensive knowledge on part of the selling firm about the commodity tax systems in "foreign" tax jurisdictions, and also provide the consumer with full information about the total price of the good at the point of sale. The tax collection would be moved entirely into the tax jurisdiction of the buyer but would, of course, impose some handling costs on the courier. Given that the selling firm still needs extensive knowledge of (many) "foreign" commodity tax systems it is not obvious that this procedure would be more efficient than when the seller also collects the tax.

For both procedures it must be considered how likely non-compliance with the tax collection will be, and what can be done to prevent non-compliance. Obviously, the selling firm has no direct economic incentive to become registered with the tax authorities in other tax jurisdictions. Of course, if the

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<sup>11</sup>Formal registration with "foreign" tax authorities will both guarantee that the right tax rates are being used and make the transfer of the tax payments an easy task. The registration itself is, however, a costly burden that may make some firms reluctant towards engaging in e-commerce. Some commentators like Nellen (2001) have argued that such requirements will put online shops at a disadvantage compared to traditional retail firms and therefore should be avoided.

tax jurisdiction is a country with customs control it is possible to exclude non-registered foreign firms by simply stopping any goods passing through the customs control that are not shipped from a registered firm. To what extent this will solve the problem of non-compliance depends on the efficiency of the customs control.<sup>12</sup> Considering the efficiency of these tax collection procedures the costs of having an effective customs control should be taken into account. When the commodity tax jurisdictions belong to the same country (or a customs union) with no customs control for inter-tax jurisdictional trade non-compliance may be much harder to prevent. The obvious case here is the US (see more on the US sales and use tax system below) where a requirement of registration with out-of-state tax authorities is likely to be unconstitutional (by reference to the Quill ruling, see footnote 20).

A third option would be to remove all responsibilities regarding tax calculation and tax collection from the seller and delegate that to the courier firm handling the shipment of the good.<sup>13</sup> For the consumers that would certainly add some uncertainty about the total price of the good at the point of sale. For the courier firms additional handling costs are imposed (which obviously must be passed on to the consumers as higher shipping costs). How to deal with the compliance issue again depends on whether the tax jurisdictions have their own customs control. In case effective customs control is possible it would be natural to let the customs office calculate the tax payment and just let the courier collect the tax. Without a customs authority the tax authorities could induce compliance by performing effective tax auditing of the courier firms.

Which of these procedures should be preferred it not obvious as all have their pros and cons. Requiring the seller to handle all the tax administration will presumably reduce the number of firms selling through the internet, thereby effectively reducing the degree of competition on that market leading to higher consumer prices. Similarly, letting the courier firms handling the tax administration would lead to increased uncertainty about the final consumer price leading to reduced demand from (risk averse) consumers. Of course, the selling firms could try to resolve that uncertainty by inform-

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<sup>12</sup>Customs controls are never fully effective but if consumers know that registration is required for a good to be allowed through customs, demand for goods from non-registered firms is likely to be low (even if the goods come tax free). It is often mentioned that lack of trust by consumers of the firms selling through the internet is a major cause for consumers not to shop online. Non-registration will serve as a good signal to consumers that the seller may not be trustworthy.

<sup>13</sup>Considering again the US case since the courier transports the good from the seller to the buyer it could be argued that the courier firm by definition has "nexus" in both tax jurisdictions in which case it might not conflict with the constitution if the courier is required to collect the tax on behalf of the tax authorities of the buyer's residence state.

ing their customers about relevant tax regulations but that advice would be merely informative and not legally binding.

Taking these administrative aspects into account reveals that although there is nothing formally hindering destination taxation of e-commerce in physical goods it is not necessarily straightforward to set up proper administrative procedures that will be conducive to a well-functioning e-commerce market. Using the origin principle is somewhat less problematic as tax calculation and tax collection is done within the tax jurisdiction of the seller and the buyers will enjoy full certainty regarding the tax-and-shipping-included price of the good.

### 2.3 Qualitative Properties of the Tax Principles

Considering the various costs and disadvantages related to the administrative procedures of the two tax principles, the origin principle could seem preferable to the destination principle. Still, there may be other properties of the tax principles that may be relevant to consider before a preferred tax principle can be nominated. To discuss the qualitative properties of the two tax principles it is useful to consider a simple two country model with a Home ( $H$ ) and a Foreign ( $F$ ) country. Each country contains a representative online shop selling a homogenous good, but due to taxation and trading costs<sup>14</sup> prices need not be the same in the two countries. Let  $p^i$  denote the producer price<sup>15</sup> of the good in country  $i = H, F$ , while (unit) taxes are  $t^i$ ,  $i = H, F$ . Normalizing the trading cost for a consumer buying at home at zero the trading cost of a foreign purchase is denoted  $\Delta > 0$ .<sup>16</sup>

Assume first that both countries use the destination principle, implying that a resident of country  $H$  will buy in his own country if

$$p^H + t^H < p^F + t^H + \Delta,$$

or

$$p^H < p^F + \Delta,$$

while a resident in country  $F$  will make all his purchases in his own country if

$$p^F + t^F < p^H + t^F + \Delta,$$

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<sup>14</sup>These trading costs could simply reflect shipping costs.

<sup>15</sup>At this stage we do not consider how the firms make pricing decisions. Of course, in a full equilibrium analysis such price decisions should be fully modelled.

<sup>16</sup>Thus,  $\Delta$  is basically the excess trading cost of buying abroad instead of buying at home. It seems reasonable that online shops will charge higher shipping costs for goods to be shipped abroad than for goods shipped domestically.

or

$$p^F < p^H + \Delta.$$

Notice that in both cases the purchase decisions are made without interference from taxes. If both countries instead use the origin principle a resident of country  $H$  will buy in his own country if

$$p^H + t^H < p^F + t^F + \Delta,$$

while a resident in country  $F$  will make all his purchases in his own country if

$$p^F + t^F < p^H + t^H + \Delta.$$

Now the taxes will influence the purchase decisions which is why the destination principle is often preferred to the origin principle on efficiency grounds:<sup>17</sup> Under the destination principle the competition among firms is not distorted by the taxes whereas origin taxation distorts the competitive position of the firms and may therefore affect the location decisions of these firms. The destination principle is also the preferred tax principle of the OECD (stated in the "Ottawa framework").

Let's briefly consider what can happen if the two countries do not use the same tax principle. In this case taxes will not only influence the purchase decisions of the consumer but may lead to inefficient cross-hauling of goods. Assume that country  $H$  uses the destination principle<sup>18</sup> while country  $F$  uses the origin principle. In this case a consumer in country  $H$  will buy goods in country  $F$  if

$$p^F + t^H + \Delta < p^H + t^H,$$

while a consumer in country  $F$  will buy his goods in country  $H$  if

$$p^H + \Delta < p^F + t^F.$$

Rewriting these two conditions as

$$\begin{aligned} p^H &> p^F + \Delta \\ p^H &< p^F + t^F - \Delta, \end{aligned}$$

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<sup>17</sup>For more on this see e.g. Frenkel *et al.* (1991). Origin taxation is basically in conflict with the Diamond-Mirrlees (1971) production efficiency theorem stating that with a full set of tax instruments and no pure profits production decisions should not be distorted by taxes.

<sup>18</sup>It is assumed that the destination principle is applied in its pure form where the domestic tax rate becomes the effective tax rate also for imports that are taxed at origin. In case the foreign tax rate exceeds the domestic tax rate this requires that the domestic tax authorities pay back the excess tax to consumers on imported goods.

it follows that for  $p^H > p^F$  these conditions can be satisfied simultaneously when the trade cost is not "too big" and  $t^F$  is not "too small". If cross-hauling is a possible equilibrium this must be an inefficient equilibrium since the cross-hauling of goods with positive trade costs is inefficient from a world economy point of view, and its existence is caused entirely by the differences in tax principles.<sup>19</sup> In this sense the two countries may have an incentive to at least use the same tax principle. Whether this should be the destination or the origin principle seems to be a trade-off between the superior efficiency properties of the destination principle against the administratively more desirable origin principle.

### **3 What Are the Risks of Revenue Losses due to E-Commerce?**

One of the main fears of policy-makers and tax collectors regarding e-commerce is the risk of losing tax revenue when trade is redirected from taxable commodities to - presumably - untaxable activities. In order to evaluate the relevance of such fears at least three matters should be considered: First, loss of tax revenue requires that the trades now being conducted through the internet are actually untaxable which we just have argued will only be the case for purely digitalized goods. Second, in case e-commerce substitutes for trade in commodities that are not taxed anyway there is no tax revenues to be lost. Finally, from a public finance point of view the required (or desired) tax revenue is not exogenously given but rather determined by the balance between the marginal benefits of public goods and the marginal costs of public funds, and in principle both the benefits and the costs may be affected by the emergence of e-commerce.

Calculations of projected revenue losses from an increasing level of e-commerce - done mostly for the US - suggest that while only modest at the present stage they may turn out to become significant in the near future. However, the projected revenue losses for the US may somewhat overstate the revenue losses for other countries since some of the revenue losses in the US are primarily present due to the inadequacies of the US-sales tax system (see e.g. Varian (2001) and Zodrow (2003) on the inadequacies of the US sales tax). Given that the US and EU cases differ substantially it seems worthwhile to consider them separately.

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<sup>19</sup>We could easily have the same tax rates in the countries and still have cross-hauling. What we do need is differences in producer prices in the two countries, but if both countries used the same tax principle cross-hauling would not be a possible equilibrium even with differences in producer prices.

### 3.1 Revenue Losses from E-Commerce: The US Case

The commodity tax system in the US is a rather complex system of local and state taxes (five states have no commodity taxation, the remaining states tax at least part of the consumption of commodities and the both the tax bases and the tax rates vary from state to state). The taxation of commodities is meant to follow the destination principle so that commodities are taxed according to the destination of the final consumption of the goods. As long as the seller and the buyer of a commodity that is subject to taxation belong to the same state a sales tax is levied and collected by the seller. For out-of-state purchases a use tax is levied on the buyer. Collection of the use tax is made by the seller in case the seller has physical presence, or "nexus", in the buyer's state of residence but without nexus collection of the use tax is left to self reporting by the buyer.<sup>20</sup> Since the compliance rate for use taxes is next to nothing (see Varian (2001)) most consumers regard out-of-state purchases from firms without nexus as tax free. This is especially relevant for e-commerce since many of the large companies specializing in e-commerce (like amazon.com) tend to have nexus in only a few states.<sup>21</sup> Notice, however, that this is basically a case of tax evasion on part of the buyers of e-commerce and the Internet Tax Freedom Act (ITFA) of 1998 (later extended to 2003) placing a moratorium on the implementation of new internet taxes has nothing to do with the perceived status of e-commerce as being untaxed: The use tax is not a new tax so in principle buyers of e-commerce are required to pay use taxes under the ITFA, but the lack of effective enforcement makes non-compliance a pretty risk free strategy.<sup>22</sup>

Sales and use taxes also apply to purchases by firms although extensive exemptions are provided for goods that are intended for resale or are component parts. However, since only around 60% of the total sales and use tax revenue stems directly from consumer purchases (see Ring (1999)) the taxation of intermediate goods is not unimportant from a revenue point of

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<sup>20</sup>This follows a U.S. Supreme Court ruling in the Quill case saying that a state can not require out-of-state companies (without nexus) to collect use taxes for purchases by state residents.

<sup>21</sup>The location decision of a e-commerce firm is, of course, dependent on this aspect of the sales tax/use tax system. A good location from a tax point of view is either a state without sales and use taxes or a state with a sales and use tax from which only a small amount of trade is expected.

<sup>22</sup>A similar kind of tax evasion takes place when consumers engage in cross-border shopping in other states e.g. when travelling for other purposes. Such tax evasion is probably unavoidable but if the same good is purchased online (and escape taxation) instead of when travelling the resulting increase in e-commerce does not represent a loss of tax revenue.

view.<sup>23</sup> Especially since the compliance rates for businesses are expected to be far higher than for consumers due to the more effective tax auditing procedures this aspect may be important for the size of the revenue losses. What matters for the potential loss of tax revenue is to what extent businesses can avoid taxation by buying online and given the higher compliance rates for use taxes levied on firms the only possibility seems to be purchases of digital goods like software. However, to the extent computer software is subject to sales and use taxation it seems unlikely that standard tax auditing would not detect usage of such programs in which case a use tax can be imposed. So it may be the case that even digital goods purchased by businesses can be taxed due to effective auditing procedures.

The loss of sales and use tax revenue from a higher level of e-commerce should therefore mainly come from reduced sales tax payments as consumers redirect demand from goods sold through bricks-and-mortar stores to remote (out-of-state) e-commerce. As we have argued earlier, this certainly includes purchases of digitalized goods as well as remote online purchases of tangible goods that are subject to sales and use tax and that previously were bought through traditional retail stores. To get reliable projections for future levels of the tax revenue losses it is not sufficient to obtain predictions on the future growth in e-commerce but also to obtain predictions of what part of the traditional trade this e-commerce is substituting for. Although sales and use tax regulations differ widely across the states the coverage of these commodity taxes is fairly low by international standards as important items as services and groceries are often exempt from taxation. So purchases of airline tickets and financial services - two of the big items in e-commerce - generates no tax revenue no matter which marketing channel is used.

Predictions of future tax revenue losses should therefore not be based on aggregate estimates of the growth of e-commerce but need a much more disaggregated framework concentrating on predicting the growth in demand for digital goods and tangible goods escaping use taxation by private consumers. However, since part of these predictions amounts to predicting the demand for "new" goods, i.e. digital goods whose nature we may not know presently a great deal of inaccuracy should be expected.

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<sup>23</sup>Perhaps more importantly, taxing intermediate goods may not comply with efficient second-best taxation. As emphasized by the production efficiency theorem of Diamond and Mirrlees (1971) under ideal conditions (including constant returns to scale, perfect competition and an unrestricted set of tax instruments) the second-best optimal tax structure should not tax intermediate goods. However, if markets are less than perfectly competitive it is not obvious that taxation of intermediate goods could not be part of an optimal tax policy.



### 3.2 Revenue Losses from E-Commerce: The EU Case

The value-added tax system in the European Union (EU, henceforth) has some features making it superior in many respect to the sales and use tax system in the US - but it also has some less desirable features. First of all, being a valued added tax the effective tax on intermediate goods is zero so the EU VAT system is truly a tax on final consumption. The main principle behind the EU VAT-system is - just like for the sales and use tax in the US - the destination principle.

For e-commerce in physical goods the general rule is that a transaction is taxed at the VAT rate applicable in the country of residence of the buyer. For sellers in other EU countries this implies that they have to register with the tax authorities in all EU countries where they have private customers. There is a minimum threshold, however, such that if the total annual sales of the seller to residents of a country falls below a certain threshold<sup>24</sup> no registration is required and the tax on such sales follows the origin principle (taxed at the rate applying in the seller's country). Thus, for intra-EU e-commerce in physical goods a mixture of the origin and the destination principles applies. It is not obvious, however, how compliance with these thresholds is enforced. For sellers located in countries with low VAT rates<sup>25</sup> there is an incentive to apply the local VAT rate even after the threshold has been reached. The tax authorities in the country of the seller have no incentive to try to register how much every single firm sells to private consumers in the various other EU countries, so it should be expected that enforcement of the threshold is left with the tax authorities of the importing countries. This could be accomplished through customs control, but since the EU Internal Market is supposed to work without border controls among the member states that would be against the spirit of the Internal Market. Moreover, firms with sales above the threshold could set up subsidiaries and distribute sales among the subsidiaries such that the sales of no single subsidiary exceed the threshold. For this reason it may well be that a major part of the intra-EU online trade in physical goods will be taxed according to the origin principle. Considering tax revenue losses from e-commerce in physical goods within the EU the question is mainly one of redistribution of tax revenues as it is likely that high tax countries will experience a deficit on the e-commerce trade balance due to the origin principle applying to at least part of the transactions. Hence, high tax countries will lose tax revenue and low tax countries will gain revenue.

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<sup>24</sup>These thresholds are either 35,000 or 100,000 Euro (year 2000 levels) depending on the size of the (importing) country.

<sup>25</sup>Currently VAT rates range from 15-25% so some economic incentive exists for avoiding paying a VAT at the high end of the range.

That will implicitly put pressure on the high tax countries to lower their VAT rates, and since it is the stated goal of the European Commission that the VAT rates should be harmonized the existence of these hard-to-enforce thresholds may be explained by this desire to get VAT harmonization.

For e-commerce in physical goods between non-EU firms and customers with EU residence the residence principle applies fully and traditional customs control imposes the relevant tariffs and taxes. The collection of tariffs and taxes is then done by the courier when the good is delivered. It should be noticed here that as a consequence of this procedure non-EU firms do not have to register with EU tax authorities. On the other hand, it also implies that the consumer at the time of purchase may not realize the full price of the good. Obviously, if the customs control for physical goods entering an EU country from outside the EU is reasonably effective no tax revenue losses occur from this e-commerce.

Finally, the trade in digital goods has to be considered. Prior to 2003 sellers of digitalized goods located within EU should pay VAT on all their sales, even on their exports, whereas imports of digitalized goods into the EU were untaxed (so the origin tax principle applied).<sup>26</sup> Such procedures put EU companies at a competitive disadvantage and lead to adoption of an entirely new way of treating the taxation of digitalized goods by mid-2003. A new directive, EU (2002), specifies that non-EU sellers are required to pay VAT on sales of digitalized goods to EU residents. After an interim period of three years within which a supplier of digital goods can choose to register with only one EU member state and pay VAT according to the VAT rate applicable for this state, non-EU sellers must register in all the EU countries they deliver digital goods to. EU firms selling digital goods abroad will be zero rated on their exports to non-EU customers and pay their local VAT to customers in other EU countries (origin principle). Apart from using a mix of destination and origin principles this directive presupposes that foreign suppliers of digital goods will truthfully report their sales to EU residents to the tax authorities of the resident's country. Given the technical (and economical) difficulties of verifying transactions in digital goods it is not likely that the compliance rate will be particularly high. Of course, the directive makes lack of tax payments on digital goods a case of tax evasion but unless it becomes easier to verify that a transaction has taken place it is unlikely that many foreign-based firms will comply with this directive.<sup>27</sup> It

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<sup>26</sup> Again, we have to question how effectively taxation of digital goods could have been enforced.

<sup>27</sup> That will in particular hold for small foreign businesses that are unlikely to be caught by EU tax authorities providing digital goods to EU citizens. For larger firms - e.g. Microsoft - it may be difficult to avoid registration but the amount of sales declared is

is therefore quite likely that the EU-countries just as the US will experience some loss of tax revenue as e-commerce in digitalized goods continues to grow.

Summing up, even though the European Commission hopes to be able to tax trade in digitalized goods it is likely that a substantial part of the sales of digital goods will escape taxation. For physical goods, however, the EU seems on a more promising track with the main revenue problem being one of redistribution among the member states.

### 3.3 Optimal Provision of Public Goods

A final point to be mentioned is that the desired level of tax revenue is not an exogenously given magnitude. Instead, the tax authorities decide on how much revenue to raise by determining the optimal level of public goods to be provided. The optimal provision of public goods is determined by balancing the marginal benefits of public goods and the marginal cost of public funds (see e.g. Myles (1995)). Looking at what determines the marginal cost of public funds aspects such as the elasticities of tax bases are important determinants. As e-commerce becomes more important the commodity tax base becomes more elastic, mainly due to sales of digitalized goods being largely untaxable.<sup>28</sup> Thus, we should expect that the tax authorities will respond to the growth of e-commerce by reducing their required tax revenues. On the benefit side of public goods provision it cannot be ruled out that this is also affected by the emergence of e-commerce, but it is not obvious whether e-commerce increases or decreases the marginal benefits of public goods to consumers.<sup>29</sup>

## 4 Should E-Commerce be Taxed?

So far we have analyzed to what extent e-commerce can be taxed and apart from trade in digitalized goods the conclusion has been that it is possible to tax e-commerce. But just because it is possible to tax (part of) e-commerce it is not obvious that it is socially desirable to do so. In this section we will

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almost at the discretion of the firm since it is rather expensive to verify the true level of sales.

<sup>28</sup>The larger elasticity of the commodity tax base follows because an increase in commodity taxes makes (untaxed) digital goods relatively less expensive thereby increasing the demand for digitalized goods and reducing the tax revenue.

<sup>29</sup>One possibility would be for the public sector to use the internet more intensively to provide some of their services and if this reduces the cost of providing a given amount of public goods, the required tax revenue should be reduced, as well.

briefly consider some of the arguments that have been raised in the discussion of granting preferential tax treatment of e-commerce.

#### **4.1 Tax Preferences Based on Existence of Externalities?**

It is a standard result in welfare economics that existence of externalities in a market can be used as an argument for intervention through taxes or subsidies to correct the externalities. In particular, if consumption of a commodity by a household (of a firm) generates positive external effects on other agents the market equilibrium will generally under-provide the commodity in question. To correct this under-provision a subsidy to the consumption (or production) of the commodity may be granted. Given that most countries already tax (some parts of) consumption the presence of positive externalities from e-commerce could then call for preferential tax treatment of e-commerce to (partly) correct these externalities.

What kind of externalities could emanate from e-commerce? As argued by Zodrow (2003) general positive network externalities could be present as the benefit from belonging to a network like the internet is increasing in the number of users of the network. There are, however, several reasons why these network externalities cannot be used as arguments for taxing e-commerce at lower rates. First of all, since the biggest users of the internet are likely to become connected first (as their private benefit from using the internet is high compared to others for any size of the network), the marginal external benefit of having more users joining the network is likely to decline as soon as the network has reached a certain size.<sup>30</sup> Before the network achieves its critical mass it can be argued that a subsidy to new users will be welfare improving but as soon as the critical mass has been reached the benefits of giving further subsidies to new users fall short of the cost of doing so. In a similar direction works the emergence of congestion effects that at some point in time will generate negative externalities. Second, giving (Pigouvian) subsidies to internalize external effects requires that the subsidies are targeted at what generates the externalities. In the present context this could require subsidizing getting access to the internet (subsidizing the installation of the internet connections). A general tax subsidy to e-commerce would be a very imprecise instrument as new users of the internet would be interested in many other ways to use the internet than just to purchase various goods. At the

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<sup>30</sup>The benefit for heavy users of the internet from more marginal users becoming connected to the internet and e.g. mainly use it for sending the occasional e-mail is quite small.

very least, it would be difficult to argue that a permanent tax subsidy to e-commerce would be warranted.

## 4.2 Tax Preferences Based on Optimal Taxation Arguments?

Even in the absence of externalities the theory of optimal commodity taxation can be used for granting "preferential tax treatment" to some commodities. The theory of second-best taxation - where absence of lump sum taxation creates a need for distortionary taxes to be employed - generally advocates taxing different commodities at different rates. Probably the most well-known result in second-best commodity taxation is the Ramsey inverse elasticity rule stating (loosely) that the effective tax rate on a commodity should be inversely related to the price elasticity of demand for the good in question (see e.g. Myles (1995) for a textbook exposition of this result).<sup>31</sup> Thus, in this simple case it would be relevant to grant preferential tax treatment to e-commerce (though not necessarily general tax exemption) if goods sold through the internet are more price-elastic than goods sold through bricks-and-mortar stores. For the inverse elasticity rule to be applicable in this context we must think of the commodity sold through the internet and the commodity sold through traditional retail shops as different goods with a zero cross-price elasticity of demand, a condition that at most can be satisfied in the case where each good is supplied through just one of the competing marketing channels. In case the same good is supplied through both marketing channels the theoretical framework behind the inverse elasticity rule is simply inadequate for describing what constitutes the optimal taxation of goods in these circumstances.<sup>32</sup>

Another instance of non-uniformity of optimal tax rates is the Corlett-Hague result that tax rates should be highest for goods that are more complimentary with (untaxed) leisure (see e.g. Bruce *et al.* (2003) and Munk and Rasmussen(2003)). In the present context with many of the goods actually purchased through the internet being leisure goods (airline tickets, movie tickets, sports equipment etc.) this would call for taxes on e-commerce being *higher* than on ordinarily traded goods. Again we must, however, be cau-

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<sup>31</sup>The inverse elasticity rule holds only under rather stringent assumptions, including zero cross-price elasticities of demand, but the important point is that the "opposite" result of optimality of proportional commodity taxation holds only under even stronger conditions.

<sup>32</sup>As described below when the competing marketing channels deliver the same commodity one of the relevant welfare effects of commodity taxation may be to influence the degree of competitiveness in domestic retail markets that may suffer from imperfect competition.

tious in interpreting the Corlett-Hague rule in its strict form<sup>33</sup> since we have to consider all goods sold through the internet as one good and all goods sold through normal retail stores as the other good. It is far from obvious that such an aggregation into composite goods is a reasonable one.

Optimal taxation arguments do not seem to be able to support a general recommendation of granting tax preferences to e-commerce. It could be argued, however, that this is due to the optimal taxation framework being inadequate for dealing with the case of parallel distribution channels. Hence, we need to consider frameworks where these competing distribution channels are explicitly modelled. Since we have previously argued that digitalized goods may be effectively untaxable the focus in the following will be on e-commerce in physical goods.

## 5 Taxation of E-Commerce: Imperfect Competition and Trade Costs

E-commerce distinguishes itself from traditional retail trade in (at least) two respects: It represents a different marketing channel for firms and it is a different way of distributing goods from producers to consumers. To evaluate how a socially optimal tax system should treat e-commerce it must be taken into account how different tax systems affect the marketing of goods and the distribution of the goods, in order to strike a balance between "socially optimal marketing" and "socially optimal distribution" of goods.<sup>34</sup>

To discuss how goods should be optimally distributed from producers to consumers it is necessary to take a spatial point of view. Assume for the sake of the argument that there are only two options for distributing goods: Either the producer delivers the good to bricks-and-mortar retail stores from where the consumers buy the good or the good is delivered directly from the producer to the consumers which in our case will represent e-commerce.<sup>35</sup> An important difference between these two modes of distributing goods is that

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<sup>33</sup>Furthermore, the Corlett-Hague rule only holds in its strict form in the three good case with one untaxed good (leisure) and two taxed goods.

<sup>34</sup>Some would argue that consumers do not derive satisfaction from the commodity itself but from the attributes of the commodity, including how it is purchased, see Bruce *et. al* (2003). If this is the case we cannot view e-commerce and traditional retail trade as alternative distribution channels for the same good. In our context, however, we will make the assumption that consumers care about the commodity itself and not through which channel it has been achieved (except, of course, to the extent there is a price difference between the two types of outlets).

<sup>35</sup>Of course, we could introduce wholesale firms and have them either dealing with the retailers or with the consumers directly.

the trade costs differ for the two types of trade, mainly due to differences in the mode of physical transportation. For most physical goods it seems reasonable to assume that economies of scale are present in the transportation of goods, such that the unit cost of transportation is smaller for large shipments of the good than when small amounts of the good is being transported. Therefore, it may be reasonable to assume that there is an excess unit cost of transportation when the good is sold through e-commerce. On the other hand, setting up retail stores is costly<sup>36</sup> and since the shopping cost of consumers from buying at a specific retail shop is increasing with the physical distance between the shop and the residence of the consumers each retail store will tend to serve the consumers of a certain geographical area. The size of this area will depend on how densely populated the area is and there may exist areas that are so scarcely populated that it will not be profitable to locate a shop in that area. Under realistic assumptions about shopping behaviour it is likely that an extensive presence of retail stores is necessary for a "socially optimal" distribution of consumer goods.

These arguments take the degree of product market competition for given, but naturally there will be a relation between the retail market structure and the degree of competition on the market. From a social point of view more product market competition is desirable<sup>37</sup> and the existence of retail shops serving a limited part of the entire market may lead to the existence of "local monopolies". An important aspect of e-commerce is, however, that it transcends the boundaries of such local monopolies by potentially serving all consumers in the economy. Hence, introducing e-commerce to an economy consisting of many local retail monopolies will reduce the monopoly power of the retail stores leading to increased economic efficiency.

Taking these two set of arguments together a trade-off may exist between the most efficient way of distributing the goods - which requires extensive presence of retail stores - and the most efficient market form - which requires extensive presence of online shops. With equal commodity tax treatment of e-commerce and traditional retail trade it is not obvious that the right balance between these two considerations is obtained. Hence, it may be of interest to examine whether it could be welfare improving (from a social point of view) to give preferential tax treatment to e-commerce.<sup>38</sup>

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<sup>36</sup>Of course, it is also costly to set up an internet based store but that cost is small compared to setting up a retail store.

<sup>37</sup>One possible disclaimer to this statement is the second-best argument that when there are multiple "distortions" reducing only one distortion may be welfare reducing.

<sup>38</sup>Although concepts like "socially optimal" have been used in the discussion so far we do not intend to consider what determines the socially optimal tax structure (basically because the model proposed is too simple for that purpose). Instead we will consider

As an example, consider the following very simple partial equilibrium model. There are two economies, the Home country (denoted  $H$ ) and the Foreign country (denoted  $F$ ). A physical good  $x$  is produced at a constant marginal cost,<sup>39</sup>  $c$ , by perfectly competitive firms in the foreign country. The good can be distributed through two alternative channels to consumers in the home country, either through a (local) monopoly retail firm or it can be delivered directly from the producing firms to the consumers in country  $H$  when purchased through the internet. The (inverse) demand for the good is given by

$$q = q(x),$$

with a negative derivative,  $q'(x) < 0$ ,  $q$  being the consumer price of the good. For purchases made through the local retail store a unit tax,  $t$ , is levied so that the domestic producer price,  $p$ , is given by  $p = q - t$ . With economies of scale in the transportation of goods it is assumed that there is an excess unit trade cost when the good is sold through e-commerce, and this excess trade cost is assumed to be the same for all consumers and constant at the level,  $\gamma$ . The main purpose of the analysis will now be to analyze the consequences of granting preferential tax treatment to e-commerce. As a measure of social welfare we will (crudely) use the sum of domestic producers surplus, consumers surplus and the tax revenue.<sup>40</sup>

Consider first the pure effect of e-commerce when a neutral tax policy is pursued, i.e. when both types of trade are taxed identically. The residence principle is assumed to be applied. If the trade cost is sufficiently high there will be no consequences of e-commerce what so ever. The total cost of buying one unit of the good online is  $q_E = c + t + \gamma$ . Absent e-commerce the local domestic retail firm charges the monopoly price,  $q_M = p_M + t$ , so if  $p_E = c + \gamma > p_M$  the local monopoly is undisturbed by the foreign competition. Therefore, we assume that the trade cost is sufficiently small,  $\gamma < p_M - c$ , to make e-commerce matter for the Home country.

\*\*\* figure 1 about here \*\*\*

In this case e-commerce acts as an effective maximum price on the monopoly by cutting the monopoly price down to  $q_1 = c + \gamma + t$ , and there is a

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whether welfare improvements can be obtained by taxing e-commerce and ordinary retail trade differently (so we are looking for the existence of welfare improving tax reforms starting from equal tax treatment of the two retail channels).

<sup>39</sup>To simplify, the marginal cost of production includes the costs of transportation for bulk-trade between the foreign firms and the domestic firm.

<sup>40</sup>Apart from the usual problem of using consumers surplus as a welfare measure by simply adding the three elements we disregard any concerns with redistribution.



strictly positive welfare gain to the domestic economy, see figure 1. Thus, e-commerce is unambiguously a good thing for the Home economy as it reduces the monopoly power of the domestic retail firm. How much gain can be reaped obviously depend on the size of the trade cost with an inverse relation between the size of the welfare gain and the size of the trade cost.

It may be possible to obtain an even larger welfare gain, however, if e-commerce is granted preferential tax treatment relative to ordinary retail shopping. To begin with assume that e-commerce is taxed at the unit rate  $t_E$  such that for  $t_E \in [0, t[$  preferential tax treatment is granted.

For  $\gamma > t$  the case is quite straightforward since setting  $t_E = 0$  provides the highest attainable social welfare level (for  $t_E \in [0, t[$ ), see figure 2.

\*\*\* figure 2 about here \*\*\*

By not taxing e-commerce the highest level of competitive pressure is exerted on the domestic retail firm and since  $\gamma > t$  all trade remains with the local firm. This implies that no resources are wasted on shipping goods bought through e-commerce and the welfare gain is unambiguously positive.

For  $\gamma < t$  just granting full tax exemption for e-commerce will imply that all trade is moved from the domestic retail firm to e-commerce and since that will induce some costs in terms of higher trade costs the welfare effect will generally be ambiguous. Instead, partial tax exemption will do the trick. By setting  $t_E = t - \gamma$  the domestic retail firm is forced to set its price at the marginal cost,  $c + t$ , so the welfare effect is unambiguously positive,<sup>41</sup> see figure 3.

\*\*\* figure 3 about here \*\*\*

Thus, in this model it is always possible to grant some degree of preferential tax treatment in a socially welfare improving manner. There are, however, some critical aspects of model that need to be discussed further. First of all, preferential tax treatment of e-commerce just required that the tax on e-commerce did not exceed the tax on domestic retail trade and in general the tax on e-commerce should be inversely related to the trade cost of e-commerce for the welfare effect to be unambiguously positive. Since different goods carry different trade costs this would require a range of differentiated taxes for goods purchased through the internet and once administrative costs of taxation are included the gains from administering a complicated differentiated tax structure may be negligible compared to the administrative

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<sup>41</sup>In fact, the welfare level is maximized by this tax level since it forces the domestic firm to set its price equal to marginal cost.

costs.<sup>42</sup> Therefore, it could be argued that the choice should be binary: Either e-commerce is granted full tax exemption,  $t_E = 0$ , or e-commerce is taxed like ordinarily traded goods,  $t_E = t$ . In this case preferential tax treatment of e-commerce no longer needs to be welfare enhancing, see figure 4. When the full e-commerce price excluding taxes is below the tax-included marginal cost of the domestic retail firm, so  $\gamma < t$ , all trade becomes e-commerce and the extra resource cost associated with shipping the commodities under e-commerce may more than offset the beneficial effects of lower consumer prices (as it appears to be the case in figure 4).

\*\*\* figure 4 about here \*\*\*

These considerations lead to a more general remark on the model as presented so far, *viz.* that it is problematic that retail trade and e-commerce cannot coexist. One way of getting both trade channels active at the same time is by assuming that different consumers have different trade costs. Of course, if trade costs are just shipping costs the natural assumption may seem to be that all consumers have the same trade cost. However, as shipping costs often are independent of the amount bought different consumers may face different unit shipping costs if they buy different quantities. This aspect alone would imply a range of different trade cost levels for different consumers. More generally, trade costs may include more than just shipping costs. From a marketing point of view the trade cost represents anything that can allow the domestic firm to increase its price without making consumers switch to e-commerce, so if consumers are uncertain about delivery times, the security of the payment system, problems (and expected costs) of returning the goods etc. the trade cost may not only exceed the bare shipping costs but also vary among consumers. Hence, simple extensions of the model may account for coexistence of e-commerce and ordinary retail trade for the same good (see Rasmussen (2004) for such analyses).

It is beyond the scope of the present paper to analyze the consequences of having a range of trade costs among the consumers but it should be mentioned that in this case there are generally two distinct effects of giving preferential tax treatment to e-commerce: A pro-competitive effect<sup>43</sup> as the price mark-up of the domestic retail firm is reduced when private households

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<sup>42</sup>This is in line with the view of Zodrow (2003) who argues that granting tax preferences to e-commerce based on the existence of externalities must require that these externalities are quantitatively substantial.

<sup>43</sup>Since the pro-competitive effect represents in reduction in the consumer price of the good it is also associated with "trade creation" as the amount of the good traded internationally will increase.

can trade directly with the foreign producer; and a trade diversion effect as e-commerce may redirect trade between the foreign producer and the domestic retailer to trade between the producer and domestic households. The pro-competitive effect will always enhance efficiency and increase welfare whereas the trade diversion effect is generally ambiguous due to the higher trade costs associated with e-commerce relative to inter-firm trade.<sup>44</sup> This implies that a sufficient condition for preferential tax treatment of e-commerce being welfare improving is that no e-commerce takes place in equilibrium after the introduction of preferential taxation of e-commerce. Likewise, if preferential taxation of e-commerce leads to a reduction in the amount of e-trade welfare is bound to increase. If, however, the amount of e-trade increases due to the preferential tax treatment, the overall welfare effect is generally ambiguous.<sup>45</sup>

Of course, the simple model presented here cannot account for all possible consequences of granting preferential tax treatment to e-commerce. Apart from what is already mentioned above the modelling of firm behaviour is far too simple. If preferential tax treatment is granted to certain kinds of marketing channels firms will have incentives to set up marketing channels that will allow them to take advantage of the preferential tax treatment. In our case this could amount to the domestic retail firm setting up an online business, the nature of which would depend on the specific conditions needed to qualify for special tax treatment. If, e.g., the US "nexus" requirement is specified such that tax preference is only granted if the firm does not have physical presence in country  $H$  the domestic firm would have to set up a foreign subsidiary taking care of all the e-sales of the firm to qualify for tax preference.<sup>46</sup> The domestic retail firm would under these rules typically not be allowed to handle returns or warranty claims. To model such a situation would require a more symmetric model with the possibility of having online shops in both countries. The costs of setting up online shops relative to bricks-and-mortar shops could play an important role for what kind of market equilibria could be established under these circumstances.<sup>47</sup>

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<sup>44</sup>In terms of figure 4 the pro-competitive effect of granting tax exemption for e-commerce is the decrease in consumer price from  $c + \gamma + t$  to  $c + \gamma$  leading to an increase in demand from  $x_1$  to  $x_4$ ; the trade diversion effect is the shift from retail supply to e-commerce supply for the quantity  $x_1$ .

<sup>45</sup>This is exactly why the welfare effects are positive in figures 2 and 3 while the welfare effect in figure 4 is negative.

<sup>46</sup>If nexus is allowed the traditional retail shops could, as noted by Varian (2001) have online terminals in the shopping area so that the customers could order their goods online from inside the retail shop and pick them up on the way out. This would effectively make all trade qualify for preferential tax treatment, implying that the "non-nexus requirement" may be quite reasonable if tax preferences are granted to e-commerce.

<sup>47</sup>Another interesting aspect of firm behaviour is the emergence of technologies allowing

Somewhat related to the options of firms to set up either physical retail stores and/or online stores is the question of who will tend to support granting tax preferences to e-commerce. Of course, consumers will generally gain<sup>48</sup> while the domestic retail firms are likely to lose (the loss of profits coming from the pro-competitive effect of granting tax preferences to e-commerce). In our simple model the foreign firms acting both as suppliers to the retail firm in the home country and as suppliers of e-trade are not affected by the tax policy of the Home country since they simply sell the goods at the constant marginal cost level (yielding zero pure profits for these competitive firms). In more realistic settings where imperfect competition is present in both retail and online markets there will typically be profit effects for the online firms. Of particular interest could be the case where online shops have a physical retail store counterpart. In that case it is not obvious whether the firms - now acting both as physical retail stores and online stores - will benefit from tax preferences granted to e-commerce since the tax preferences will induce more product market competition, possibly making all firms worse off. That would also be consistent with the presence of the "e-Fairness Coalition"<sup>49</sup> - an organization consisting of both shopping centres and online firms - arguing for tax neutrality between online and offline trade. Although their formal arguments go along the lines of "fairness in competition" it may be that their real concern is that untaxed e-commerce may lead to "excessive" competition and reduced profits, especially if online firms in the end are owned by the same people owning the traditional retail stores. However, some further theoretical modelling is needed before the validity of such claims can be assessed.

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online firms to use automated marketing procedures as described by Vulkan (2003). The importance of this so-called "second-generation" e-commerce is yet to be witnessed.

<sup>48</sup>That holds for all consumers considered as a group. If different consumers have different levels of trade costs associated with e-commerce it may happen that granting tax exemption to e-commerce will make consumers with high trade costs worse off (see Rasmussen (2004)). The intuition for this result is that if some consumers have rather high trade costs granting tax exemption to e-commerce may not be sufficient for these consumers to start buying online. However, by granting tax preferences to e-commerce consumers with lower trade costs may switch from local retail shopping to e-shopping. This leaves the local retail firm with the high trade cost consumers only, and this may enable the local retailer to actually increase the price as a response to the tax preferences granted to e-commerce.

<sup>49</sup>See their website at <http://www.e-fairness.org>.

## 6 Concluding Remarks

We have established that for all e-commerce except trade in digitalized goods it is technically possible to tax online trade. Setting up efficient administrative procedures for taxing e-commerce in tangible goods is not necessarily a straightforward task, however. If the policy-makers succeed in setting up such administrative procedures the main threat for the tax authorities comes from purchases of digitalized goods. The European Commission has proposed legislation that makes avoiding paying taxes on purchases of digital goods a case of tax evasion but it is yet unclear to what extent these procedures will be effective in generating tax revenue from trade in digital goods.

Various arguments for granting preferential tax treatment to e-commerce have been discussed in the literature but none of those considered so far seem to provide a convincing case for granting tax preferences to e-commerce. One possible argument for granting preferential tax treatment to e-commerce that has not yet been analyzed in the literature is that by giving preferential tax treatment to e-commerce the degree of product market competition can be enhanced. The downside to such an arrangement is that the per unit shipping cost is likely to be substantial higher for individually shipped goods purchased online than for goods purchased in bricks-and-mortar stores making the overall welfare effect of granting preferential tax treatment to e-commerce ambiguous. What remains to be analyzed is under what conditions the overall welfare effect will be positive or negative.

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Figure 1. Welfare Effects of E-Commerce.

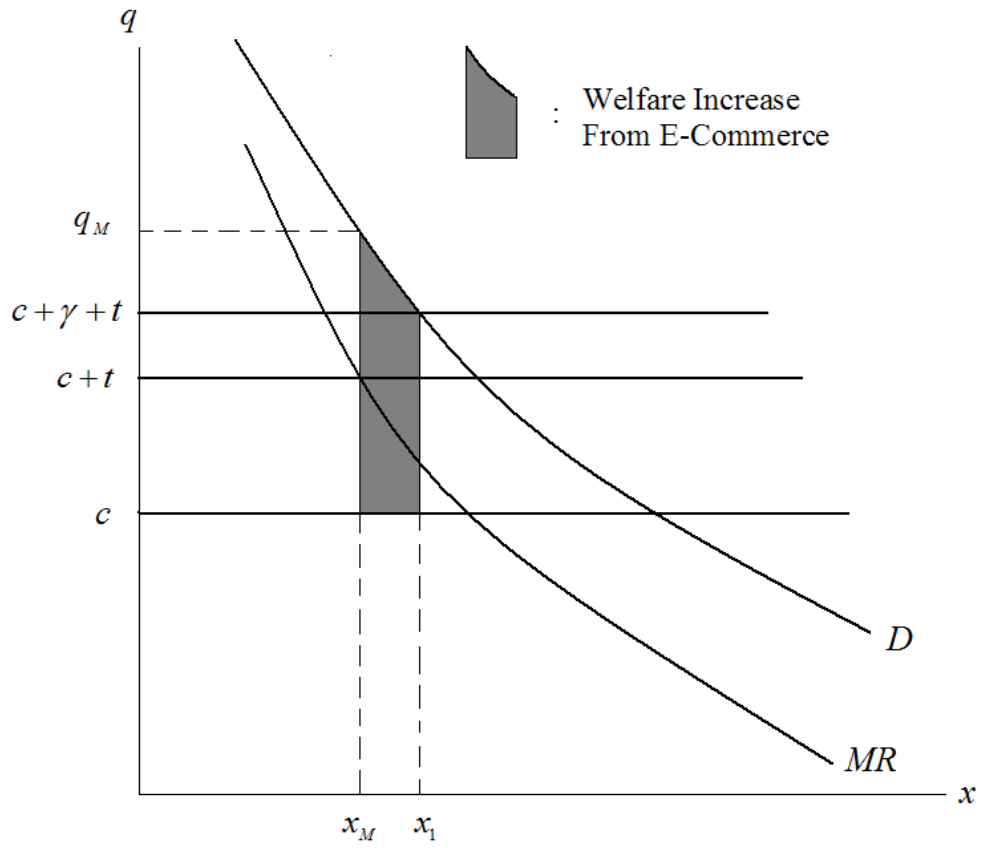


Figure 2. Welfare Effects of Preferential Taxation of E-Commerce.

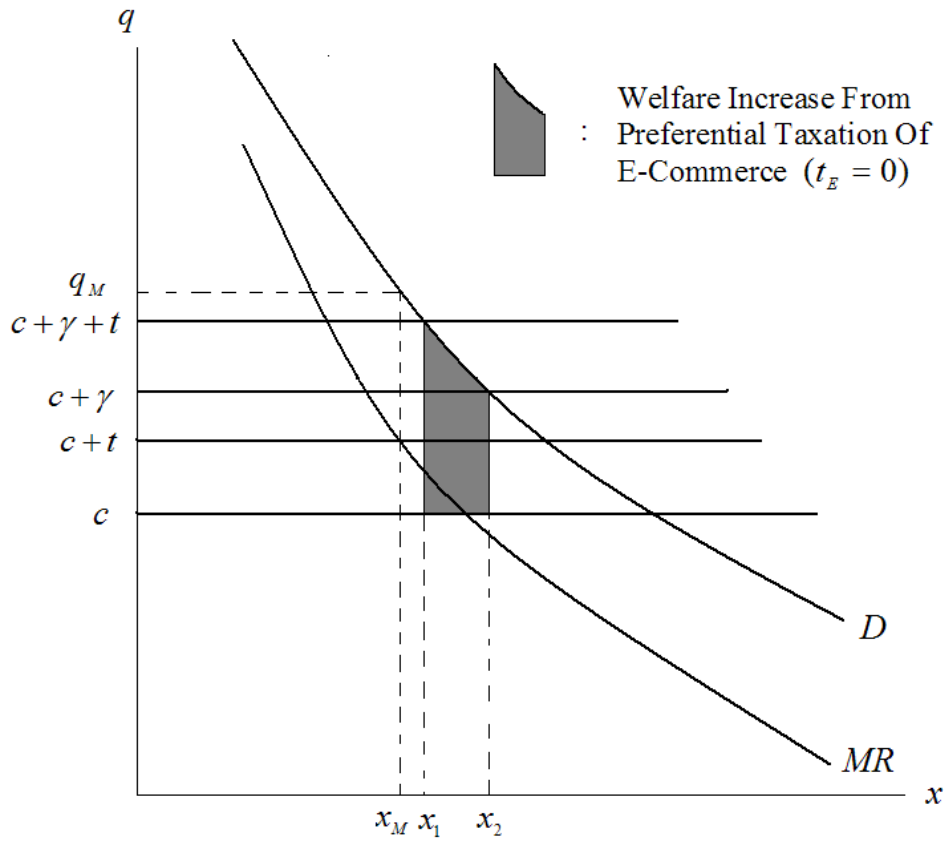




Figure 3. Welfare Effects of Preferential Taxation of E-Commerce.

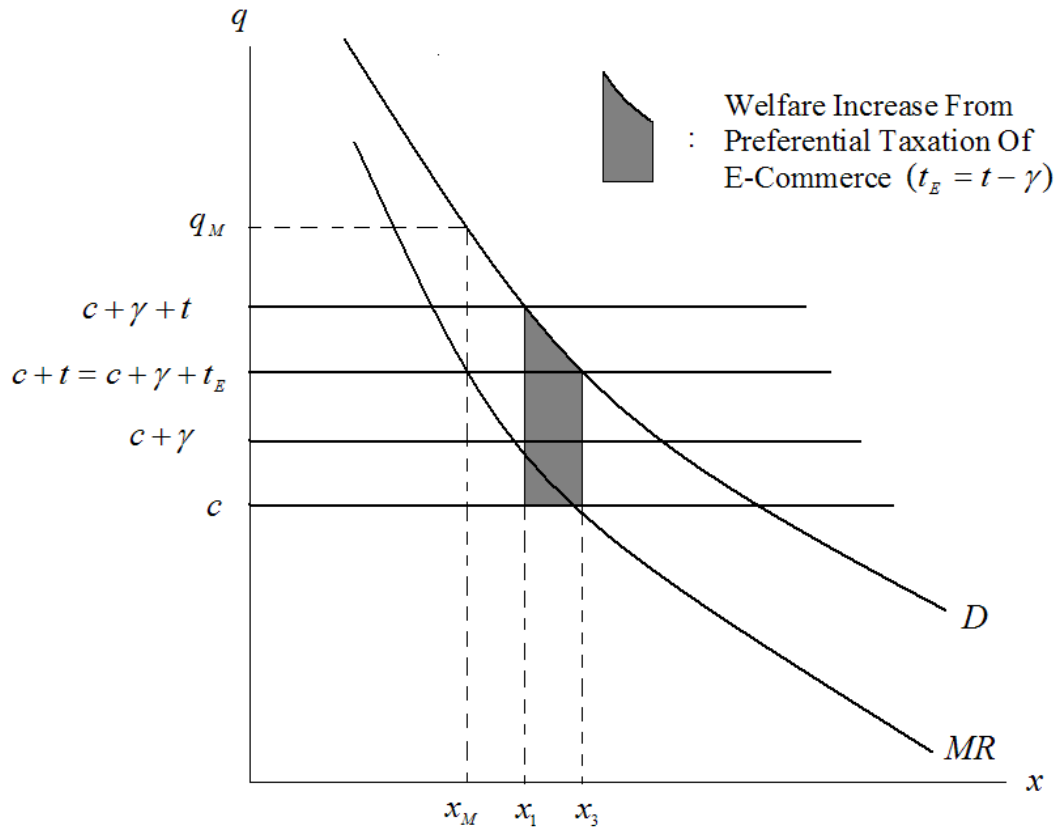
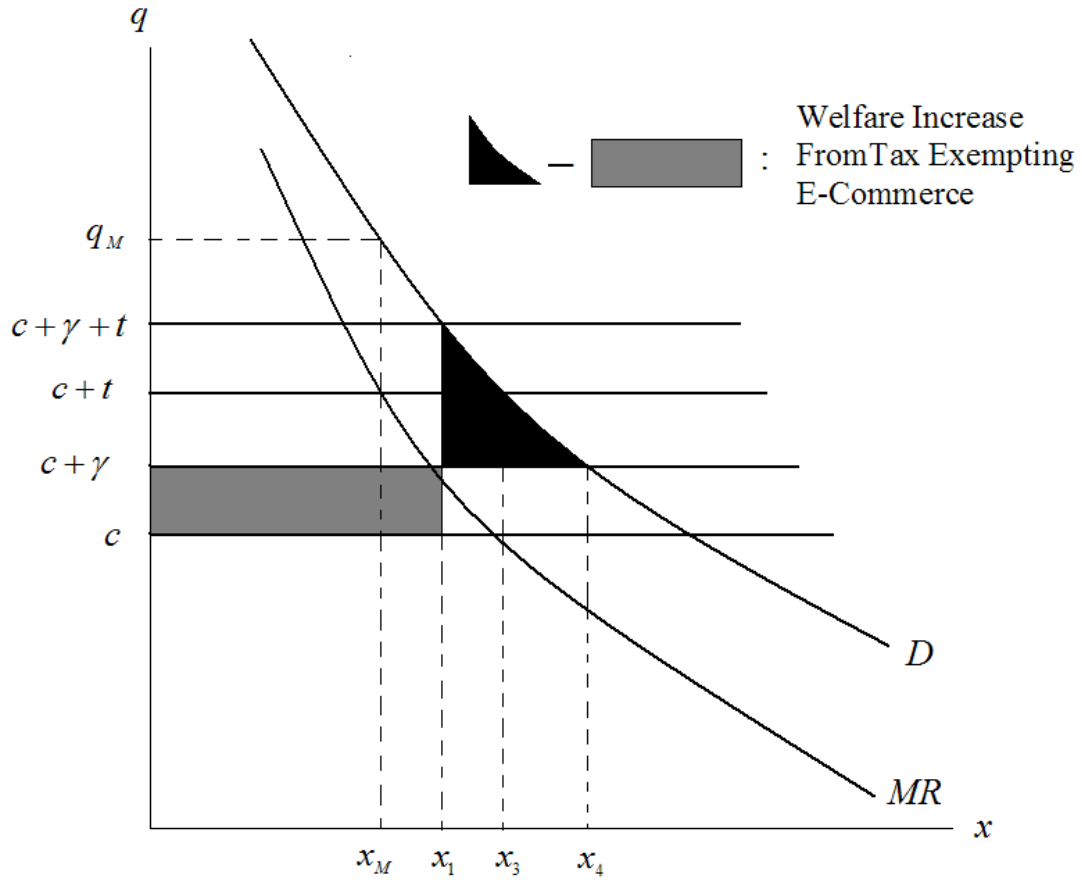


Figure 4. Welfare Effects of Tax Exemption of E-Commerce.



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