Knocking on Tax Haven’s Door:  
Multinational Firms and Transfer Pricing  *

Preliminary and incomplete - please do not circulate

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Abstract

This paper analyzes the transfer pricing of multinational firms. We propose a simple framework in which intra-firm prices may systematically deviate from arm’s length prices for two motives: i) pricing to market, and ii) tax avoidance. Multinational firms may decide not to avoid taxes if the risk to be sanctioned is high compared to the tax gap. Using detailed French firm-level data on arm’s length and intra-firm export prices, we find that both mechanisms are at work. The sensitivity of intra-firm prices to foreign taxes is reinforced once we control for pricing-to-market determinants. Most importantly, we find almost no evidence of tax avoidance if we disregard exports to tax havens. A back-of-the-envelope calculation suggests that tax avoidance through transfer pricing amounts to about 3% of the total corporate taxes collected by tax authorities in France. The lion’s share of this loss is driven by the exports of 400 firms to three tax havens. As such, it may be possible to achieve significant revenue increases with minimal cost by targeting enforcement.

Keywords: Transfer pricing; Tax haven; Pricing to market

JEL classification:

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1 Introduction

This paper investigates the impact of foreign corporate tax rates on the pricing strategies of firms located in France. To guide our empirical analysis, we study the determinants of intra-firm and arm’s length prices in a simple theoretical framework. Using detailed firm-level data on the arm’s length and intra-firm prices set by French exporters in 1999, we show that firms charge lower intra-firm prices in countries with a low effective corporate tax rate. We further demonstrate that the bulk of tax avoidance comes from a few large firms through exports to a relatively limited number of tax havens.

A wealth of empirical evidence finds that, within an MNE, reported profits systematically vary with local corporate tax rates.\(^1\) This may be due to several types of efforts within the firm, including transfer pricing. From the perspective of tax authorities, internal transactions between related parties should be valued at the market price: this is the arm’s length principle (see OECD 2012, for details). Deviating from this rule allows firms to shift profits from high- to low-tax countries. The general perception is that profit shifting is in large part achieved by manipulating transfer pricing.\(^2\)

Direct empirical evidence of tax-induced transfer pricing however is scarce. Identifying such a strategy raises two major difficulties. While multinationals’ exports are directly observable, detailed information on the prices of products and their modes of transaction – whether it is arm’s length or intra-firm – is generally not available. Moreover, it is impossible to observe the counterfactual arm’s length prices of an intra-firm transaction (see Diewert et al. 2006, for details). Since the arm’s length price is not observed, tax authorities have to fix the market price, which raises obvious definitional and methodological issues.

In this paper, we overcome both difficulties. We observe the export prices under each mode at the level of firms, countries and products. Our econometric methodology allows moreover to compare the intra-firm price with its corresponding arm’s length price. Our empirical results reveal new important evidence, which might also be important for policy makers. We show that the bulk of tax avoidance comes from a few large firms through exports to a relatively limited number of tax havens, where the baseline estimates find that intra-firm prices are on average 11% lower than arm’s length prices.\(^3\) This suggests that, by targeting enforcement efforts, tax authorities may be able to mitigate transfer pricing and raise tax revenues, while keeping enforcement costs low. The granular dimension of tax evasion should ease the implementation of such global enforcement as the one proposed by

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1See Fuest et al. (2003) for a survey on the impact of taxation on real MNE activity.
2An OECD survey of tax authorities reaches the conclusion that “tax administrations see transfer pricing as one of the most significant tax risks they have to manage” (OECD 2012, p.15). Gresik (2001) provides a survey with a greater emphasis on the transfer pricing literature. A recent meta-analysis by Heckemeyer & Overesch (2013) shows that transfer pricing and licensing are two important means of shifting profits abroad. Recent theoretical contributions on tax-induced transfer pricing include Behrens et al. (2009), Bernard et al. (2006), and Keuschnigg & Devereux (2013) which provides a recent model of non-tax-induced transfer pricing, one motivated instead by manipulating managerial incentives. Diewert et al. (2006) gives an overview of the different rationales for manipulating internal prices.
3In our sample, Switzerland, Ireland, Luxembourg and Cyprus are classified as tax havens. About 20 firms report 60% of intra-firm trade to these countries.
In order to frame our empirics, we first develop a theoretical model on the determinants of arm’s length and intra-firm prices. The model goes beyond the traditional theoretical literature as it takes into account both tax-induced transfer pricing and pricing-to-market strategies. The latter has been receiving increasing attention in the field of international trade.\textsuperscript{4} The model shows that an exporting MNE finds it optimal to deviate from the arm’s length prices when it exports to countries with a different level of taxes than the home country. The wedge between the intra-firm price and the arm’s length price is a decreasing function of the host tax. We also show that arm’s length and intra-firm prices are likely to have a different sensitivity to transport costs, tariffs, and GDP per capita, i.e. variables governing pricing to market. This result suggests that one should be mindful of the different sensitivity of the two types of prices to these variables in the empirical analysis. If one of these variables is significantly correlated with the level of corporate tax rates (something which is true in our data), not allowing coefficients to differ across pricing modes would bias the estimated coefficients.

On the empirical side, we rely on a unique dataset that has detailed information on the intra-firm and arm’s length volumes and prices of exported products at the firm-level for almost all French firms actively exporting in 1999. France is a useful country for this exercise as it exempts foreign income from taxation. Compared with the U.S. where foreign tax credits and deferral complicate a firm’s tax reduction problem, the relatively streamlined French system provides cleaner mapping between tax differences and firm incentives.\textsuperscript{5} Our empirical methodology uses triadic fixed effects at the level of the firm, product and country, allowing us to control for unobserved factors that might influence the (log) level of prices, which are not taken into account in the literature. In addition, we control for several pricing-to-market variables identified as important in the trade literature (namely income, distance, and tariffs).

In line with the main prediction in our theory, our estimates suggest that export prices drop with the destination tax rate, but only for intra-firm transactions. This result is robust when we control for pricing to market. Although low taxes are important for this result, we find that the bulk of tax avoidance is attributable to the transfer pricing of exports to tax havens.\textsuperscript{6} Furthermore, 400 MNEs account for over 90% of these exports, implying that it may be possible to curb a large share of transfer pricing by focusing enforcement on a small number of firms. Extending our investigation finds that transfer pricing is concentrated primarily in large MNEs and in differentiated products for which it may be particularly difficult for tax authorities to identify an arm’s length price.\textsuperscript{7}

Although there is a large literature on the impact of international tax differences on the location of profits and firm financing, the results of which are suggestive of transfer pricing,\textsuperscript{8}

\textsuperscript{4}Examples include Bastos & Silva (2010), Manova & Zhang (2012), and Martin (2012).
\textsuperscript{5}Bernard et al. (2006) provide a detailed discussion of the complexity of the U.S. tax system.
\textsuperscript{6}Gumpert et al. (2011) provides a discussion of this in the context of an exemption-granting country like France.
\textsuperscript{7}Blonigen et al. (2014) find a comparable difference in the reaction of affiliate sales to a tax treaty across homogenous and differentiated products.
there is very little on the impact of taxes on transfer prices themselves. Bartelsman & Beetsma (2003) use aggregated data on value added across manufacturing sectors in the OECD. They estimate a value added function depending on corporate tax rates and other factors, finding results suggestive of profit shifting via transfer pricing. Clausing (2003) uses price indices for U.S. exports and imports which include separate indices for intra- and extra-firm prices, finding a strong and significant impact of taxes consistent with transfer pricing. Using an approximation of intra-firm trade from firm-level balance sheet data, Overesch (2006) finds that the value of German MNEs’ intra-firm trade varies with the difference between the German tax and that of the foreign parent/affiliate’s location. However, what he does does not amount to comparing the price to an arm’s length price. As the arm’s length price may also vary with the overseas tax, his result could be due to pricing to market instead of transfer pricing. Two interesting papers, Vicard (2014) and Cristea & Nguyen (2014), exploit the panel dimension of firm-level data on French and Danish firms respectively. Both papers tend to provide evidence on transfer pricing. They however do not observe intra-firm and arm’s length prices, but assume intra-firm prices for transactions with countries where a related party is located. Our empirical tests rely on more detailed firm-level data which enables us also to control for factors at the level of the firm, product and country. In addition, we examine the role of tax havens and show the relative importance of these countries for such strategies.

Finally, our paper is related to the work of Bernard et al. (2006) who examine how internal prices depend on taxes and tariffs using U.S. firm-level data. Similarly to the papers mentioned above and to our own results, their estimates are consistent with transfer pricing. Relative to their results, we make three contributions. First, and most importantly, we consider the tax haven status as well as tax rates. Since our estimates indicate that internal and arm’s length prices deviate the most when the destination is a tax haven, this is critical. Second, we examine how the effect of tax rates vary by destination, product, and firm characteristics. Again, our findings indicate that tax-induced transfer pricing is more aggressive in big firms, heterogeneous products, and distant destinations. Finally, by using French rather than U.S. data, we avoid the complications in taxation introduced by the U.S. foreign tax credit system.

The rest of the paper is organized as follows. In Section 2, we present the theoretical model and its predictions for the empirical analysis. In Section 3, we carefully present the data and the estimation sample construction. In Section 4, we present the baseline estimation, extend the results, and provide a quantification exercise estimating the revenue loss for France due to transfer pricing. We conclude in Section 5.

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8 For a recent discussion of the former, see Huizinga & Laeven (2008). Dharmapala & Riedel (2013) discuss the impact of taxes on firm financing.

9 Using firm-product level data, Swenson (2001) finds that prices react to taxes and tariffs, however, she is unable to distinguish between intra-firm and arm’s length transactions and thus again it is not clear whether this is linked to transfer pricing or pricing to market.

10 Bernard et al. (2006) show that the price wedge between intra-firm and arm’s length transactions depends on the size of exporters and the differentiation of products. However, they do not study whether the sensitivity of the price wedge to corporate taxes depends on these characteristics.


2 Model

In this section, we present a simple model of price-setting by a firm selling in a foreign market in order to form predictions on the effects of taxes and other factors on the difference between intra-firm and arm’s length prices (the price wedge). This firm produces an intermediate good in its home country at a constant marginal cost $c$ which it sells to its overseas affiliate at a free-on-board price $p_{MNE}^H$. This export incurs two additional per-unit costs, an ad-valorem cost $\tau v p_{MNE}^H$ and a specific cost $\tau_f$. The first of these captures features of international trade such as tariffs and insurance, the latter could, for example, represent the cost of shipping. These costs are therefore specific to the destination market. This intermediate good is then transformed into a final good at zero cost and sold to foreign consumers at a price $p_{MNE}^F$.

The transfer price $p_{MNE}^H$ can differ from the price that would be set by a firm selling to an unaffiliated party, denoted $p^H$. A firm that does not respect the arm’s length principle, incurs a cost $\Phi(p_{MNE}^H - p^H)$ where $\Phi$ is defined as follows:

$$\Phi(x) := \begin{cases} \varphi(x) + F & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$$

where $\varphi(\cdot)$ is the variable component of this cost which is twice continuously differentiable and such that $\varphi(0) = \varphi'(0) = 0$ with $\varphi'(x) > 0$ and $\varphi''(x) > 0$ for all $x \neq 0$. Last, we assume that $\varphi(\cdot)$ is an even function $\varphi(x) = \varphi(-x)$ $\forall x \in \mathbb{R}$ so that the concealment cost depends upon the price gap only. This "concealment cost" is a common feature of transfer pricing models. It is generally interpreted as the cost to hire accountants to “cook the books” and/or potential fines if the firm is found to be selling at something other than an arm’s length price. Doing so entails a fixed cost $F$ and a variable cost $\varphi(\cdot)$ which increases marginally with the price wedge. The arm’s length price is taken as given by the firm and $\Phi$ is the tax-deductible cost that occurs in the home country.

Countries levy taxes on a territorial basis, where the home tax is $T^H$ and the foreign

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11For simplicity, we abstract from domestic sales.
12See for instance Goldberg & Campa (2010) or Berman et al. (2012).
13Empirically, it means that they are selling products which belong to the same 8-digit product category nomenclature, to the same destination.
14This approach was initiated by Kant (1988) and forms the predominant method of modeling transfer pricing in theory (e.g. Haufler & Schjelderup 2000) and the empirics (e.g. Huizinga & Laeven 2008). Becker & Davies (2014) present an alternative more grounded in actual transfer pricing behavior, nevertheless, the predictions of the two approaches are comparable and we therefore use the simpler concealment model.
15We have assumed that the tax authorities care about the price deviations, abstracting from the volume which is shipped. This seems to be a reasonable approximation: for instance, Ernst & Young (2012) suggest that prices is one of the issues which receive “the greatest scrutiny” while volumes are not mentioned (p63). However, one can show that our results hold if the tax authority puts enough weight on price deviations relative to the volume which is exported ($\alpha$ close to 2). Specifically, if one assumes that the concealment cost function is $\varphi \left[ (p_{MNE}^H - p^H)^{\alpha} d \left[ p_{MNE}^F \right]^{2-\alpha} \right] + F$ with $\frac{1}{2} < \alpha \leq 2$, and $\varphi(z) = z^\alpha$, ours results hold if and only if $\alpha > 3/2$. See Becker and Davies (2014) for more discussion.
tax is $T^F$. This is consistent with the tax-exemption rule for the income earned abroad by French MNEs. This results in profits given by:

$$
\pi_{MNE} = \left(1 - T^H\right) \left(\left(p^H_{MNE} - c\right) d\left[p^F_{MNE}\right] - \Phi \left[p^H_{MNE} - p^H\right]\right) + \left(1 - T^F\right) \left(p^F_{MNE} - \left((1 + \tau_v) p^H_{MNE} + \tau_f\right)\right) d\left[p^F_{MNE}\right]
$$

which is maximized by choosing the transfer price $p^H_{MNE}$ and the price of the final good $p^F_{MNE}$. Defining the relative effective tax on foreign-earned profits by $t^F = T^F - T^H \frac{1}{1 - T^H}$, the maximization of (2) results in a first order condition for the transfer price of:

$$
\left(1 - \left(1 - t^F\right) \left(1 + \tau_v\right)\right) d\left[p^F_{MNE}\right] = \varphi' \left[p^H_{MNE} - p^H\right]
$$

Since, $\varphi()$ is even, we have that $\varphi'(x) = -\varphi'(-x) \forall x \in \mathbb{R}$. Using that $\varphi'(0) = 0$, the above equation implies therefore that the direction of profit shifting is thus determined by the sign of the left-hand side. When $\left(1 - t^F\right) \left(1 + \tau_v\right) > 1$ a firm will set $p^H_{MNE} < p^H$ in order to shift profits to the foreign country. This will happen when the corporate tax abroad is lower than at home ($t^F < 0$). This is a standard result in the transfer pricing literature. We emphasize here that multiplicative trade costs (e.g. tariffs) are also a motive for transfer pricing and that the two effects interact with one another. We summarize this result in the following proposition:

**Proposition 2.1.** The level of corporate taxes and multiplicative trade costs determine the magnitude of the deviation of intra-firm prices from arm’s length prices. Free-on-board intra-firm prices are lower than arm’s length prices in destinations with low corporate taxes or high tariffs, ceteris paribus.

The second lesson from equation (2) is that the price gap is positively correlated with the volume $d\left[p^F_{MNE}\right]$ that is exported. This occurs because, although a non-zero price wedge increases per-unit after-tax profits the marginal concealment cost is independent of quantity. If larger firms export more, this means that deviations from the arm’s length price will be increasing in firm size.

**Proposition 2.2.** Large volumes of intra-firm trade come with large deviations of intra-firm prices with respect to arm’s length prices.

**Remark 1:** The above propositions have assumed that a multinational firm necessarily finds it optimal to shift profits abroad. The fixed component in the concealment cost function however, implies that there is an inaction band. In other words, there exists a corporate tax (tariffs) difference for which firms do not shift profits abroad.

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16In a model with heterogeneous firms where output is positively correlated with productivity, a corollary is that most productive firms deviate more from the arm’s length price. However, this result holds for any source of heterogeneity.
The first order condition for the final good’s price is:

\[
\left( p_{MNE}^H - c + (1 - t^F) \left( p_{MNE}^F - (\tau_v p_{MNE}^H + \tau_f) \right) \right) d' \left[ p_{MNE}^F \right] + (1 - t^F) d \left[ p_{MNE}^F \right] = 0
\]

which equates marginal revenue and marginal demand.

Although the firm takes the arm’s length price \( p^H \) as given, this too is determined as a function of local characteristics since, as is well established, the free-on-board price of exports will vary with destination specifics. Thus, in order to accurately compare the differences between intra- and extra-firm prices and how they vary with destination characteristics, it is necessary to consider the relative responses of \( p_{MNE}^H \) and \( p^H \). Unlike the above results, which did not require assumptions on the demand curve, to avoid ambiguity we now assume that demand is iso-elastic, a feature standard in many models of trade.

The profits of a pure exporter, which both produces the intermediate and converts it into the final good at home, can be written as:

\[
\max_{p^H} \pi = \left( p^H - c \right) d \left[ \tau_v p^H + \tau_f \right]
\]

where the final consumer pays the cost-including-freight price \((1 + \tau_v) p^H + \tau_f\). With iso-elastic demand, the demand curve can be written as:

\[
d \left[ \tau_v p^H + \tau_f \right] = A \left( \tau_v p^H + \tau_f \right)^{-\eta}
\]

where \( A \) is a demand shifter which depends on the market structure and \( \eta \) is the constant price-elasticity of demand.\(^{17}\)

The in order to maximize profits, the exporter sets a free-on-board price of:

\[
p^{H*} = \frac{\eta}{\eta - 1} \left( c + \frac{\tau_f}{1 + \tau_v} \right)
\]

which is increasing in trade costs whenever \( \tau_f > 0 \). Since transport costs increase with distance, fob prices are expected to increase with distance as found by Bastos & Silva (2010), Manova & Zhang (2012), Martin (2012). Since distribution costs are an increasing function of foreign wages, we expect fob prices to increase with GDP per capita as found by Simonovska (2010). Thus, exporters price to market, resulting in an arm’s length price that varies by destination. Note, however, that as all revenues and costs are incurred at home, this price is independent of taxes.

Returning to the MNE’s first order conditions, with iso-elastic demand, (2) and (3) become:

\[
(1 - \left( 1 - t^F \right) \tau_v) A \left( p_{MNE}^F \right)^{-\eta} = \varphi' \left[ p_{MNE}^{H*} - p^{H*} \right]
\]

\(^{17}\)In a CES model of monopolistic competition, this constant is \( \frac{y}{\eta P} \) where \( y \) stands for income, \( P \) is a price-index of all varieties supplied in the market and \( \eta \) can be interpreted as the elasticity of substitution between varieties.
and

$$p_{MNE}^F = \frac{\eta}{\eta - 1} \left( \tau_v p_{MNE}^H + \tau_f - \frac{(p_{MNE}^H - c)}{(1 - t_F)} \right)$$  \hspace{1cm} (8)

Equations (6), (7) and (8) determine implicitly $p_{MNE}^H$ and $p_{MNE}^F$.

**Remark 2:** the elasticity of $p_{MNE}^H$ with respect to $\tau_F$ is not trivial and generally different from the elasticity of $p^H$. This implies that the sensitivity of arm’s length and intra-firm prices with respect to distance and GDP per capita is likely to differ. However, without more structure on the model, one can not infer whether the price gap is magnified or reduced when, let’s say, distance or GDP per capita increase.

Thus, the size of the price wedge will vary according to destinations. Failure to account for this can potentially result in misleading estimates of the impact of taxes on the difference between intra- and extra-firm prices.

This theoretic exercise yields a set of predictions for us to take to the data. First, a higher destination tax should lower the intra-firm price but have no effect on arm’s length prices. Second, prices should be an increasing function of specific trade costs (such as distance) and destination income but a declining function of ad valorem trade costs (such as tariffs). Finally, there should in general be differences in the impacts of these three variables on arm’s length prices and transfer prices. In the next section, we describe the data and methodology used to test these predictions.

### 3 Data and identification strategy

#### 3.1 Data description

To investigate the factors driving transfer pricing, we use detailed information on intra-firm and arm’s length export prices for a set of French firms in 1999. In order to construct our estimation sample, using a unique firm identifier, we combined three datasets that have detailed information on firm-level exports values and quantities of 8-digit product categories by destination, data on MNE status, and information on whether the transaction is intra-firm or arm’s length. We merge these datasets with information on country-level characteristics such as the level of corporate tax rate, distance, tariff or per-capita income.

**Firm-level data.** Our first dataset comes from the French Customs which reports the free-on-board values and quantities of exports by firm, 8-digit CN product category, and destination. We combine the value and quantity of export for firm, product CN8, and destination triad to construct the destination- and firm-specific free-on-board unit values – our proxy for the price a firm charges for that good in a given market.

This dataset, however, does not provide information on the mode of exports, that is, whether a transaction is intra-firm or at arm’s length. We obtain this information from a confidential 1999 survey of MNEs in France (both French and foreign-owned) which comes
from the INSEE.\footnote{Échanges internationaux intra-groupe.} The survey was addressed to all such MNEs with trade worth more than 1 million Euro and covers firms providing 87\% of the French total industrial product exports.\footnote{www.insee.fr/fr/ffc/docs_ffc/IP936.pdf, INSEE WP 936, Table 1.} An observation in the survey identifies, by firm, the share of exports to a destination in a specific HS 4-digit product that are intra-firm, where intra-firm trade is defined as trade with a related party – directly affiliated or not – controlled by the firm.\footnote{Some transactions are broken into two lines if the firm has to announce an amount larger than the one previously filled by the customs services. We have aggregated these lines.} If this export share exceeds 98\%, we classify all of the firm’s exports of CN8 products corresponding to this HS4 code exports as intra-firm transactions.\footnote{Changing this threshold will marginally change the qualitative results of our empirical analysis.} If the share is zero, we classify the CN8 codes as arm’s length. When the share is positive but below 98\%, we drop this firm’s observations within this destination-HS4 dyad, observations which amount to roughly 11.4\% of French exports.

The INSEE survey provides a detailed geographical breakdown of French MNEs’ export values and quantities at product level (HS4) and their exporting modes – through outside suppliers and/or related parties. Using a CN8-HS4 correspondence table, we match each 8-digit product category to their corresponding HS4 category. When the INSEE indicates that an HS4 category has a share of intra-firm exports exceeding 98\%, we classify all the corresponding CN8 exports by MNEs to be intra-firm transactions.\footnote{Changing this threshold will marginally change the qualitative results of our empirical analysis.} We assume for non-MNEs that all exports are done at arm’s length and are done through unrelated parties.

Finally, we use information from LIFI, a French-firm level dataset on financial linkages between firms. This is used to determine whether a firm in the French customs data is a MNE and, if so, its nationality and the country locations of their related parties. As this identifies some firms in the French customs data as MNEs but for which we do not have the INSEE data, we drop those observations as we cannot know whether the transaction is intra-firm or arm-length.\footnote{This amounted to a decline in the number of MNEs from 4,198 to 4,153, amounting to a drop 1.5\% of French exports in value.} We also eliminate the observations of state-owned firms has these firms might have a different price setting mechanism.\footnote{They account for 2.2\% of French exports}

This then leaves us with firm-level information at the firm, NC8 product, country, and exporting mode level. Once merged with country characteristics, there are 742,863 observations in our unbalanced baseline sample. Our cross section is composed by 64,752 firms, 5,468 products and 31 countries. About 8.7\% of the total number of observations are intra-firm prices. It is worth emphasizing that most of the prices set by MNEs are not intra-firm prices. Only 30\% of the prices set by MNEs are intra-firm prices.

**Tax data.** We follow the most recent literature on corporate taxation and MNE activities and compute the effective average tax rate (EATR) as a measure of corporate tax burden (Egger et al. 2009). We follow Devereux & Griffith (1998, 2003) and use the data of Loretz.
to calculate our EATR measure. Compared to the statutory tax rate, the EATR has
the advantage to reflects the actual tax rate paid by the average firm on profits declared
abroad. We used the EATR reported in 1998 or 1997 (whichever is closer) when the data
for 1999 were missing.

The effective average tax rates vary considerably across countries. In our estimation
sample, the EATR ranges from 9% in Ireland to 42% in Germany. Of large concern in policy
circles is the use of investment in tax havens in aggressive tax planning. This is particularly
the case for countries such as France or Germany that exempt foreign income from taxation.
We therefore use additional information on tax havens. Our definition follows Hines & Rice
(1994) which has been recently used by Dharmapala & Hines Jr. (2009). Compared to the
list of Tax Havens produced by the OECD (2000), the approach of Dharmapala & Hines Jr.
(2009) identifies a number of additional tax havens such as Switzerland. In our estimation
sample, Cyprus, Ireland, Luxembourg, and Switzerland are classified as tax havens. In our
sample, approximately 40% of firms export to these countries and these exports account for
roughly 10% of the total number of observations.

Pricing to market data. As discussed above, firms adjust their prices to the characteristics
of the destination market. The empirical literature has identified two main regularities
on the firms’ pricing to market behavior, namely, firms charge higher prices when the destination if further away and when the destination is wealthier (eg. Bastos & Silva 2010, Manova
& Zhang 2012, Martin 2012). Berman et al. (2012) have shown that small and large firms
may react differently to trade costs depending on their size and productivity. In our model,
we show that these factors may impact intra-firm prices differently from arm’s length prices.
Furthermore, as these market characteristics are correlated to the level of corporate tax rate,
it is crucial to control for them. We therefore use data on per capita GDP (measured in US
dollars) from the Internal Financial Statistics of the IMF to control for the level of country
specific income. As measures of trade costs, we use the bilateral distance variable (which
is the population weighted average distance between countries’ main cities in kilometers)
which is taken from CEPII database (Mayer & Zignago 2006) and also use information from
TRAINS on tariffs faced by French exporters developed by the WITS (UNCTAD). In our
data distance and per capita GDP are both significantly and negatively correlated with both
the EATR and tax haven status, suggesting that their omission could bias our results.

3.2 Identification strategy

Testing the main propositions of our model requires estimating the effect of the tax variables,
the EATR and/or tax haven, on the differential between the intra-firm price of a specific
product in a country and its corresponding arm’s length price. We therefore regress the (log)

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A drawback of the EATR as discussed by Devereux & Griffith (1998, 2003), is that it measures
the average tax paid rather than the marginal tax, a measure perhaps better suited when analyzing the choice of
a continuous variable such as the price. Nevertheless, due to data restrictions, we proceed with the EATR.

See the recent paper by Gumpert et al. (2011), who considers this issue for a large sample of German
MNEs.
of export prices on the tax variable and its interaction with an indicator of the exporting mode that is equal to 1 if the transaction is intra-firm and 0 if it is at arm’s length. Given the set of controls that we mention below, the estimated interaction coefficients gives an indication of the price wedge that is due to transfer pricing. As noticed by Bernard et al. (2006), there is a wide set of unobservables at the level of the firm, product and exporting mode that might also account for the levels of price differential. We therefore include a triadic set of firm × product × export mode fixed effects to account for the unobservable attributes of the transactions at firm-product level that may also vary across export mode. In addition, in some specifications, we use destination fixed effects to control for destination-specific heterogeneity.

The empirical strategy involves estimating the following model:

\begin{equation}
    p_{fpcm} = \alpha_1 \text{Intra}_{fpcm} + \alpha_2 \text{Tax}_c + \alpha_3 \text{Tax}_c \times \text{Intra}_{fpcm} + \gamma_1 X_c + \gamma_2 X_c \times \text{Intra}_{fpcm} + \mu_{fpm} + \epsilon_{fpcm}
\end{equation}

where $p_{fpcm}$ is the export price charged by firm $f$ for product $p$ in country $c$ under the export mode $(m)$. $\text{Tax}$ is a variable that capture the level of tax in the destination country. Our first measure is based on the EATR, defined as $\text{Tax}_c = \log(1 - \tau_c)$, with $\tau_c$ being the EATR in country $c$. Our second measure is a dummy equal to one if the country belong to the tax haven list of Hines and Rice (1994): $\text{Tax}_c = \text{TaxHaven}_c$. These are both also interacted with $\text{Intra}_{fpcm}$, a dummy variable that takes the value of one if the export mode is intra-firm and zero otherwise. Since we expect the price wedge to be increasing in the amount of profits retained by the firm, we anticipate both of these interactions to be positive.

The term $\mu_{fpm}$ is a comprehensive set firm-product-mode fixed effects. Notice that it is no longer possible to estimate the direct effect of the export mode because of the triadic fixed effects. $X_c$ is a vector of country specific variables that includes the logarithm of distance, tariffs and the logarithm of GDP per capita. We interact these variables with the intra-firm transaction dummy as the pricing behavior of firms is also affected by bilateral trade costs and income in the destination market and might also vary across the export mode. As the prices might also be influenced by the market structure and the intensity of competition in the foreign market and since these characteristics are unobservable, we introduce a set of country fixed effects in some specifications. Finally, $\epsilon_{fpcm}$ is the disturbance term. The standard errors are allowed to be adjusted for clustering at the country-level to account for heteroskedasticity and non-independence across the repeated observations within countries.

Table 1 gives the summary statistics

4 Results

Baseline Results. According to the theoretical predictions the average internal price should be lower than the arm’s length price in country with lower average effective tax rates. Because of the interacted terms, the coefficient of the tax rate variables gives the estimated effect of the effective average tax rate on arm’s length prices while the interaction
term is the differential impact on internal prices. To find the net effect on intra-firm prices, it is necessary to sum the two coefficients. The estimates are reported in Table 2.

In column (1), we do not find a statistically significant effect of the effective average tax rate on the level of prices. We find however a negative and significant interaction coefficient. The result suggests lower internal export prices in destinations with lower tax rate. A ten percent decrease in the effective average tax rate leads to a reduction of intra-firm prices by 2.4%. Further, since by (6) arm’s length prices are independent of taxes, insignificance of the non-interacted tax variable is not of great concern as the estimates indicate that a decline in the destination’s tax has no effect on arm’s length prices but increase transfer prices.

In column (2), we control for other country characteristics that might influence the pricing behavior of the firm. Nevertheless, we continue to find comparable results, namely that taxes influence internal prices but not those between unrelated parties. If anything, the estimated impact is slightly larger, suggesting a slight bias when they are excluded. In line with the prediction of our model, we find a positive impact of per-capita GDP on the level of prices. A ten percent increase in per capita GDP raises the export prices by 0.6%. We find however a negative and statistically significant interaction coefficient between the per capita GDP and the intra-firm mode variables. This suggests a slightly lower impact of per-capita GDP on internal prices. Turning to the trade costs variables, we find in line with the prediction of our model a positive effect of distance on export prices. A ten percent increase in distance raises the export prices by 0.8%. As an example, given the distances between France and the countries in our sample, we find the export prices to be on average 0.8% higher in Netherlands compared to Belgium. The effect of distance on internal export prices is lower.

Concerning the tariff variable, the effect on arm’s length prices is not significant. In other
Table 2 – Baseline regression, All firms

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
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<tr>
<td>(1 - τ_c)</td>
<td>0.13</td>
<td>0.15</td>
<td>-0.01</td>
<td>-0.04</td>
<td></td>
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<tr>
<td></td>
<td>(1.276)</td>
<td>(1.311)</td>
<td>(-0.073)</td>
<td>(-0.541)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- × Intra_fpmc</td>
<td>-0.24***</td>
<td>-0.26***</td>
<td>-0.16**</td>
<td>-0.09**</td>
<td>-0.10*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-3.031)</td>
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<td>(-2.579)</td>
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<tr>
<td>TaxHaven_c</td>
<td>0.13**</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>(2.203)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- × Intra_fpmc</td>
<td>-0.12***</td>
<td>-0.09***</td>
<td>-0.09***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-3.383)</td>
<td>(-2.997)</td>
<td>(-3.480)</td>
<td></td>
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<td></td>
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<tr>
<td>Per Capita GDP_c</td>
<td>0.06***</td>
<td>0.04**</td>
<td>0.04**</td>
<td>0.04**</td>
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<tr>
<td></td>
<td>(3.006)</td>
<td>(2.126)</td>
<td>(2.060)</td>
<td>(2.100)</td>
<td></td>
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<tr>
<td>- × Intra_fpmc</td>
<td>-0.03***</td>
<td>-0.01</td>
<td>-0.01*</td>
<td>-0.01</td>
<td>-0.01</td>
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<tr>
<td></td>
<td>(-3.269)</td>
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<td>(-1.320)</td>
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<td>0.09***</td>
<td>0.09***</td>
<td>0.11***</td>
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<tr>
<td></td>
<td>(3.817)</td>
<td>(5.384)</td>
<td>(5.397)</td>
<td>(5.781)</td>
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<td></td>
</tr>
<tr>
<td>- × Intra_fpmc</td>
<td>-0.04***</td>
<td>-0.05***</td>
<td>-0.05***</td>
<td>-0.06***</td>
<td>-0.05***</td>
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</tr>
<tr>
<td></td>
<td>(-3.591)</td>
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<td>(-6.488)</td>
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<td>Tariff_c</td>
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<tr>
<td></td>
<td>(1.243)</td>
<td>(1.142)</td>
<td>(1.182)</td>
<td>(0.624)</td>
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<tr>
<td>- × Intra_fpmc</td>
<td>-0.03**</td>
<td>-0.03**</td>
<td>-0.02**</td>
<td>-0.02</td>
<td>-0.04***</td>
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<td></td>
<td>(-2.177)</td>
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<td>(-2.318)</td>
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<td>Full</td>
<td>Full</td>
<td>Full</td>
<td>w.o Tax Hav.</td>
<td>Full</td>
</tr>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>742,863</td>
<td>669,036</td>
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<td>Adj. R^2</td>
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<td>0.869</td>
<td>0.869</td>
<td>0.873</td>
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<td>α_1 + α_2=0 (p-value)</td>
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<td>.203</td>
<td>.075</td>
<td>.109</td>
<td></td>
<td></td>
</tr>
<tr>
<td>β_1 + β_2=0 (p-value)</td>
<td>-</td>
<td>-</td>
<td>.735</td>
<td>.361</td>
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</tbody>
</table>

Note: This table investigates the impact of effective tax rate, GDP per capita, distance, tariffs, and tax haven dummy on intra-firm and arm-length export prices. Effective tax rates are transformed as follows: $(\log(1 - τ_c))$. All regressions include firm-product-exporting mode fixed effects. The last column further includes country fixed effects. In column (5) we restrict the sample to countries not classified as tax havens. Robust standard errors clustered by destination are computed. Corresponding t-statistics are reported in parentheses. Significance levels: *p < 0.1, **p < 0.05, and ***p < 0.01.

In words, there is no evidence of dumping by French arm’s length exporters. This might be due to the low cross-country variation in the tariff variable as most of the transactions are...
observed in countries that are members of the European Union. However, intra-firm prices are significantly smaller than arm’s length prices in high-tariff countries. Firms choose to undervalue their exports to pay less tariffs.

In column (3), we replace our EATR variable with a dummy equal to one if the destination is a tax haven. As tax havens not only have low taxes but often provide other mechanisms that facilitate profit shifting (such as the limited exchange of information between tax authorities), one might expect that internal prices differ markedly in these nations. The results are striking. Both the tax haven dummy variable and its interaction with the intra-firm export mode are significant and estimated with a large degree of precision. We find a positive effect of the tax haven dummy variable. This result suggests higher arm’s length export prices in tax haven countries. We find the average arm’s length export price to be about 13% higher in tax havens. Given that the tax havens in our sample are mostly island or landlocked countries – geographic features that are well known to inhibit trade – comparable to the distance measure, this may be the result of higher trade costs. Nevertheless, the interaction between the tax haven and the export mode dummy variables is significantly negative, indicating that the average internal export price for a tax haven is about 12% lower than the comparable arm’s length price. This suggests that the tax havens are playing a major role in the transfer pricing strategies of firms.

This finding remains robust in column (4) as we include the effective average tax rates and its interaction term with the export mode, where we find the intra-firm export prices to be about 9 percent lower than arm’s length prices in tax haven destinations even when tax rates do not differ. Notice that the coefficient of the interaction term that involves the EATR, is much closer to zero once we control for the tax havens. As tax havens tend to have low taxes, this suggests that the results in column (2) were biased due to failure to control for tax haven status. Further, it highlights the important difference between having low taxes and having other policies that make tax planning easier. Indeed, the OECD’s (2013) Action Plan on Base Erosion and Profit Shifting makes precisely such a distinction.

In column (5), we investigate the importance of tax havens further by excluding them from the analysis. Compared to column (2), the coefficient of the interaction term that involves the effective tax rate is about three times lower, again suggesting that the bulk of the impacts in column (2) were coming from the tax havens. This estimate suggests a reduction of intra-firm prices by 0.9% following a decrease of ten percent in the effective average tax rate. We again find no statistically different impact of the effective average tax rate on the arm’s length price.

Finally, column (6) includes a set of destination specific dummy variables. Introducing the country specific effects does not allow us estimating the direct effect of the country specific variables (including the tax rate and tax haven status), but does allow us to still estimate the coefficient of the interaction term between the tax and the intra-firm mode variables. As can be seen, the tax rate interaction declines in both magnitude and significance. Nevertheless, the tax haven interaction is virtually unchanged in magnitude and becomes even more significant. Thus, even after including destination fixed effects we find evidence

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27 About 88% of the observation concerns a transaction toward an E.U. country.
of tax-induced transfer pricing which is most evident in tax haven countries.

Overall, the specifications explain from about 87% of the variation of the log level of export prices as suggested by the adjusted $R^2$. In unreported results, the findings are robust to the inclusion of further covariates like the interactions with the log level of per capita GDP and distance and the level of tariff.

**Non-linear tax effects.** To this point, we have investigated the average effect of tax rates on the export price differential. We find evidence of transfer pricing, particularly in tax haven countries which are characterized by very low tax rates. Our results suggest therefore a non-linearity of the tax rates on the price differential. We examine this effect further by running a regression using, instead of the EATR, a set of dummy variables indicating the decile in which a country’s EATR falls. We choose the 9th decile as a benchmark. This decile is composed by Belgium, Greece, and the USA which have roughly the same effective average tax rate as France and where, in theory, internal and arm’s length prices should be the same. The first decile includes countries with the lowest corporate tax rates (Estonia, Ireland, Slovenia, and Switzerland). The tenth decile includes Italy, Japan, and Germany, the country with the highest corporate tax rates.

The estimated coefficients of these interaction terms are shown in figure 1. Each dot corresponds to the interaction coefficient between the effective average tax rate and the intra-firm export mode dummy variable. We also display the confidence intervals at the 10% level. As can be seen, the estimated effects are quite heterogeneous. Along the first remark of the theoretical model, we observe an inaction band when the tax differential is not too large. The point estimate of the interaction effect is however negative and significant only for the countries with very low tax rates. This indicates that our results are very heavily driven by the lowest tax countries, two of which are also classified as tax havens.

**Additional results.** A relevant concern that has been raised in the literature studying the effects of transfer pricing is the different ability of firms to deal with transfer pricing (Bernard, et al (2006)). In our model, firms with greater size are expected to have larger price differentials. In columns (1) and (2) of Table 3, we split the sample according to the size of the MNEs measured by their total exports. In the first column, we keep drop MNEs below the 75th percentile of the distribution of firm size, i.e. keeping large MNEs and all exporters. In column (2), we drop observations of MNEs above the 25th percentile, retaining only small MNEs and all exporters. Looking at the two tax interactions, we only find significance for tax havens for the large countries. This indicates that the manipulation

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28 The sample consists of 31 countries. For this reason, the first decile has 4 countries and the others have 3 countries. Luxembourg is not included as its effective average tax rate is 30%.

29 The estimated coefficients are obtained from a regression of export prices on the tax decile of the destination country and its interaction with a dummy equal to one if the price is intra-firm. The regression also include firm-product-exporting mode fixed effects, and distance, GDP per capita, and tariffs and their interaction with the intra-firm dummy.

30 Note that as all the estimations in 3 include destination fixed effects, only the interaction terms can be estimated.
Figure 1 – Non-linear effect of corporate tax rate on transfer pricing

Note: This graph displays the price wedge between intra-firm and arm’s length prices by decile of destination country corporate tax rate. The price wedge is measured by the coefficients on the interaction between tax deciles and an intra-firm dummy in a regression of the logarithm of exports prices on firm-product-exporting mode fixed effects, tax decile of the destination country, GDP per capita, distance, and tariff, and their interaction with a dummy equal to one if the exports are between related parties. The first decile is the decile of countries with the lowest corporate tax rates. The tenth decile is the decile with the highest corporate tax rates. Decile 9 is normalized to zero (countries with the same level of tax as France). The gray area corresponds to the confidence interval at 10%.

of internal prices for tax reasons is largely a phenomenon for large firms in tax havens. Further, we find that the relationship between pricing to market and internal prices is more prevalent in large firms.

In column (3) and (4), we analyze another source of heterogeneity by operating a distinction across the nationality of ownership of a MNE. In column (3) we include MNEs that are French resident or owned at a majority by a French group (as well as all non-MNEs). In column (4), we include MNEs that are majority owned by a foreign group and all exporters. Comparing the two, we find that the coefficients are estimated more precisely in the French firms’ sample. In particular, we find the effective average tax rate to have a strong, negative and significant impact on the log level intra-firm export prices. A comparable effect is found for tax havens. These results therefore again suggest that tax havens are playing a major role in the transfer pricing strategies of French firms. In column (4), although the sign of the tax rate and tax haven variables match those in the French-only sample, the significance of both is much lower with only the tax haven variable significant at the 10% level. This suggests that similar forces are at play for this sample as well, although there may be greater noise introduced due to the variety of parent countries in this sample as compared to that in
column (3). In particular, if the MNEs other countries face worldwide taxation (as the U.S. firms in Bernard et al. (2006) do), this may illustrate the cleaner tax effects to be found by using data on FDI from a tax-exempting country.

Table 3 – Additional results

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<th>Dependent variables: Export price</th>
<th>(1)</th>
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<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra_fpme_×:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>((1 - \tau_c))</td>
<td>-0.08</td>
<td>-0.12</td>
<td>-0.17*</td>
<td>-0.05</td>
<td>0.05</td>
<td>-0.13*</td>
<td>-0.14*</td>
</tr>
<tr>
<td>((1 - 0.993))</td>
<td>(-1.178)</td>
<td>(-0.993)</td>
<td>(-1.882)</td>
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<td>(0.453)</td>
<td>(-2.034)</td>
<td>(-1.979)</td>
</tr>
<tr>
<td>TaxHaven_c</td>
<td>-0.12***</td>
<td>-0.01</td>
<td>-0.10***</td>
<td>-0.11*</td>
<td>-0.07</td>
<td>-0.08***</td>
<td>-0.10***</td>
</tr>
<tr>
<td>((-7.756))</td>
<td>(-0.228)</td>
<td>(-3.841)</td>
<td>(-2.002)</td>
<td>(-1.074)</td>
<td>(-3.295)</td>
<td>(-3.518)</td>
<td></td>
</tr>
<tr>
<td>Per Capita GDP_c</td>
<td>-0.01</td>
<td>0.01</td>
<td>-0.02</td>
<td>0.01</td>
<td>-0.03</td>
<td>-0.01</td>
<td>-0.02</td>
</tr>
<tr>
<td>((-0.977))</td>
<td>(0.295)</td>
<td>(1.000)</td>
<td>(0.468)</td>
<td>(-0.822)</td>
<td>(-1.183)</td>
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</tr>
<tr>
<td>Distance_c</td>
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<td>-0.05**</td>
<td>-0.09***</td>
<td>-0.04***</td>
<td>-0.00</td>
<td>-0.05***</td>
<td>-0.06***</td>
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<td>((-5.373))</td>
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<td>(-4.922)</td>
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<tr>
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<td>-0.04</td>
<td>-0.05***</td>
<td>-0.02</td>
<td>-0.00</td>
<td>-0.04***</td>
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<tr>
<td>((-3.807))</td>
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<td>(-1.518)</td>
<td>(-0.112)</td>
<td>(-3.371)</td>
<td>(-3.163)</td>
<td></td>
</tr>
</tbody>
</table>

Sample | Big | Small | French | Foreign | Homog. | Diff. | w/o |
Firm-Prod.-Mode FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
Country FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
Observations | 723,921 | 697,897 | 567,071 | 465,008 | 11,980 | 608,535 | 553,745 |
Adj. R\(^2\) | 0.868 | 0.869 | 0.876 | 0.871 | 0.847 | 0.885 | 0.868 |

Note: This table investigates the impact of effective taxe rate, GDP per capita, distance, tariffs, and tax haven dummy on intra-firm and arm-length export prices. All regressions include firm-product-exporting mode fixed effects. Column (1) focuses on MNEs whose export sales are above the P75. Column (2) focuses on MNEs whose export sales are below the P25. Column (3) exclude affiliates of foreign MNEs located in France. Column (4) exclude French MNEs. Column (5) contains only the products classified as homogeneous in Rauch nomenclature. Column (6) contains only the products classified as differentiated in Rauch nomenclature. Column (7) exclude MNEs whose main activity abroad is wholesale. Robust standard errors clustered by destination are computed. Corresponding t-statistics are reported in parentheses. Significance levels: \(^*p < 0.1\), \(^{**}p < 0.05\), and \(^{***}p < 0.01\).

In France, as in most countries, the tax authority’s expectation is that firms price their internal transactions according to the arm’s length principle.\(^{31}\) The main force in the above model is that deviations from this price comes at a cost, a cost which includes in part penalties incurred if a firm is caught out. When the appropriate arm’s length price is easily determined, as for homogeneous goods that are traded on organized exchange, transfer pricing should be

\(^{31}\) This means applying prices that independent enterprises would charge in identical transactions (B.O.I. 1999).
minimal. Differentiated products that are by definition specific to the relationship, however, lack such comparable arm’s length transactions (Blonigen et al. 2014). Thus, MNEs that are exporting differentiated products might more easily reduce taxes via transfer pricing. In columns (5) and (6), we use the Rauch (1999) classification and document the effect of taxes and tax havens on both the homogenous and the differentiated goods category. Goods that are exchanged on organized markets, i.e. where appropriate prices are easily verified by tax authorities, show no differences between intra- and extra-firm transactions. Differentiated products, on the other hand, do show evidence of such. Notice that the estimated coefficient reported in column (6) are in line with the one found in the baseline estimation (Column (6) of Table 2).

Finally, in column 7, we show that our baseline result are robust to the exclusion of the observations of firms active in the wholesale sectors as the pricing behavior of such firms may differ from that of others. As can be seen, the results are robust to their exclusion.

Quantification. To quantify the loss for tax authorities due to transfer pricing, we use the estimates of the baseline estimation, column (4). In our quantification exercise, we compute the loss of the exports’ values due to a lower pricing in tax havens. In 1999, the French effective corporate tax rate was 33.3 percent and brought in about 36 billions euros of corporate tax receipts.

In column (4) of Table 2, we find that intra-firm prices are 11.3% \((\exp(-0.12)-1)\) lower than the market price in tax havens, i.e. in the four tax havens in our sample, MNEs underdeclared the value of exports by this amount. Table 4 reports the share of exports and the share of these that were intra-firm for the four tax havens. As can be seen, all of these countries are important export destinations. Further, the shares of intra-firm exports to Switzerland and Ireland are very high (around 60%). In the last column, we report the value of intra-firm exports not reported by MNEs. Using the trade values in the data, the final column gives the value of under-priced exports, the sum of which comes to 860 million euros. Without this under-reporting, French tax authorities would have collected 284 million euros more. This figure can be compared to the 36 billion euros collected in 1999 (which includes both services and manufacturing), meaning that total tax revenues in that year would have been roughly 1% greater were it not for transfer pricing by manufacturing firms in these four tax havens. Interestingly, only 2,234 firms make intra-firm exports to these countries with a scant 400 firms accounting for 90% of those intra-firm exports. This suggests that a small number of firms are avoiding a large tax payment. This is an important factor to recognize as the OECD’s (2012) survey of tax authorities finds that the cost of pursuing transfer pricing MNEs is of major concern. As our results suggest that transfer pricing is

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32 Bernard et al. (2006) find that the difference between intra- and extra-firm prices is larger for differentiated goods than homogenous ones, however, they do not estimate how the effect of taxes impacts the price wedge across groups.


34 We consider all intra-firm exports not only the ones used in our estimates.

35 Note that this number does not consider any transfer pricing in the services sector for these countries.
not particularly wide-spread and is concentrated in about half of French MNEs and then to a mere four destinations, it may be possible to reduce the costs of enforcement by targeting such efforts on exports to tax havens, and on large exporters trading in differentiated goods in particular.

5 Conclusion

The purpose of this paper has been to estimate the impact of destination tax rates on the internal price of multinationals in France. Similar to the existing work of Bernard et al. (2006) and Clausing (2003), we find that internal prices are lower in destinations with higher tax rates. Unlike those studies, however, we are able to primarily link these effects to the exports destined for tax havens where intra-firm prices are 11% lower than their arm’s length counterparts. Further, such behavior is primarily found among large MNEs and in differentiated products. These results are crucial for two reasons. First, it provides support to the OECD’s (2013) assertion that there is a difference between being a low-tax country and being a tax haven which provides a tax environment particularly amenable to tax avoidance. Second, it shows that although transfer pricing may result in significant revenue losses (estimated to be 1% of total revenues by our estimation), such losses are primarily due to a small number of firms. This implies both that aggressive tax planning via this mechanism may not be as widespread as feared and that by appropriately targeting enforcement, it may be possible to achieve a significant increase in revenues at a small cost. We therefore hope that these results provide both a direction for future research on tax manipulation by firms and a foundation for the better implementation of policy.

References


Behrens, K., Peralta, S. & Picard, P. M. (2009), Transfer Pricing Rules, OECD Guidelines, and Market Distortions, Cahiers de recherche 0943, CIRPEE.


Ernst & Young (2012), Transfer pricing global reference guide, Ernst and Young.


OECD (2012), Dealing Effectively with the Challenges of Transfer Pricing.

Overesch, M. (2006), Transfer pricing of intrafirm sales as a profit shifting channel: evidence from German firm data, ZEW Discussion Papers 06-84, ZEW - Zentrum fÃ¶r EuropÃ¤ische Wirtschaftsforschung / Center for European Economic Research.


Vicard, V. (2014), Transfer pricing of multinational companies and aggregate trade, mimeo.