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– Evidence from Ukraine

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The direct and indirect costs of tax treaty policy – Evidence from Ukraine

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Abstract

We combine macro and micro data to quantify the revenue effects of Double Tax Treaties (DTT). First, drawing on administrative information, we estimate the tax sensitivity of income flows (dividend, interest and royalty payments) at an aggregate level. We find important direct revenue costs linked to treaty restrictions on taxing rights, in particular with respect to flows into a small number of major investment hubs. Importantly, however, high elasticities of income flows also suggest that increases of withholding rates at the individual treaty partner level would not necessarily result in more revenue collection. Second, we use firm-level information to estimate the sensitivity of reported profitability to changes in the relevant treaty network. Our analysis of reported MNE affiliate earning in Ukraine suggests that the ownership structure and operations with affiliates in certain jurisdictions explains reported profitability and should thus receive increased attention in risk assessment and transfer pricing audit activities.

JEL codes: F21, F23, H25, H26, H32

Keywords: Tax Treaty Policy, Transfer Pricing, Domestic Resource Mobilization, Ukraine

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1. Introduction

Double Tax Treaties (DTT) may contribute to investment and growth by avoiding double taxation and providing certainty in taxation rights, but they may also lead to considerable tax revenue losses. DTTs serve a range of purposes, including the limitation of countries’ taxing rights. They determine, for instance, how a country can or cannot tax foreign-owned companies and payment flows. The treaty-based allocation of taxing rights between capital receiving source countries and capital exporting residency countries has far-reaching revenue implications. With more than 3000 tax treaties in effect today, the global network is the foundation of the international tax architecture. Presumed tax treaty benefits should include increases in trade and investment flows, increased investment certainty, tools to combat tax evasion, and strengthening of political relations between countries. These benefits come at a cost, typically reductions in applicable withholding tax rates and limitations on tax jurisdiction. In addition, recent international activities aimed at countering treaty abuse seek to address non-negligible indirect costs linked to tax treaties, which are being used as part of aggressive tax planning strategies by companies and individuals.

Ukrainian treaties, as most tax treaties globally, are largely based on the OECD’s “Model Tax Convention on Income and on Capital”, which was initially published in 1963 and designed for countries with symmetric trade and investment relations. The UN has developed a similar model, first published in 1980, which aims to better capture interests of capital receiving developing (source) countries. Both models are similar, based on the residency principle, and allocate exclusive taxation rights to residence countries for business profits, unless these are generated through a permanent establishment (PE) in the country. Regarding passive income, the models limit the primary taxing rights of source countries by introducing maximum rates.

In recent years the role of tax treaties has been re-evaluated, most notably in the context of work led by the OECD aimed at avoiding or countering the abuse of tax treaty provisions. For many countries, including Ukraine, a debate on tax treaty policy, however, needs to go beyond the avoidance of treaty abuse and involve a more structured analysis of what a desirable treaty network would look like. In practice, tax treaty policy has often been relatively neglected and not been subject to a proper analysis of cost and benefits. In light of a number of aggregate studies, associated costs may be substantial. UNCTAD (2015), for instance, estimates that 30 percent of global cross-border corporate investment stocks have

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2 UN (2011), Model Double Taxation Convention between Developed and Developing Countries. Daurer and Krever (2014) provide a more detailed discussion.
3 The UN model does not recommend specific rates. The OECD Model Convention proposes maximum withholding rates for dividends, differentiated for substantial (5%) and small ownership in in a company (15%), for interest payments at 10%, and royalties at 0%, thus effectively providing an exclusive taxing right for the resident country of the entity receiving royalty payments. The OECD suggests that the requirement for the lower dividend withholding rate applies to shareholder exceeding a 25% interest in the company paying the dividends.
4 In 2013, the BEPS plan was initiated by the OECD, with support of the G20 and international community. The acronym stands for Base Erosion and Profit Shifting and the BEPS package includes among others: model provisions to prevent treaty abuse; standardized Country-by-Country Reporting; a revitalized peer review process to address harmful tax practices; and an agreement on improving dispute resolution.
been routed through offshore hubs; the associated annual revenue losses for developing economies amount to approximately $100 billion. Improvement of treaty networks, including revisions of lopsided treaties, is an important policy area for developing countries (IMF 2014). A number of treaties were recently cancelled or subject to important revisions. Treaty limitations on capital gains taxation and the cost of giving up or reducing withholding instruments, which can be interpreted as a ‘second line of defense’ for resource-constrained administrations against international tax planning and profit shifting, played an important role in these revisions.

This paper proceeds as follows. In Section 2 we provide an overview of the Ukrainian treaty network, its effects on business activity, and its implications for government’s revenues. We then focus on the direct and indirect costs associated with reduced withholding tax rates on dividend, interest and royalty payment from Ukraine. Drawing on administrative information, we estimate the tax sensitivity of income flows at an aggregate level in section 3. Publicly available firm-level information allows us to then estimate the sensitivity of reported profitability to changes in the treaty network in section 4. Section 5 concludes.

2. The Ukrainian Tax Treaty Network

2.1 Role and development of Ukrainian tax treaties

In Ukraine, international treaties are incorporated into domestic law. The Ukrainian Tax Code and legislation on international treaties explicitly state that in case of conflict, rules established by international treaties approved by the Verkhovna Rada of Ukraine (Parliament) shall prevail over the rules of the Ukrainian Tax Code. In practice, this means that international treaties entered into by Ukraine are hierarchically below the constitution but prevail over the Ukrainian Tax Code.

Ukraine has built a substantial treaty network, encompassing 66 double tax treaties (see Annex for the complete list). These treaties were negotiated with the partial objective of signaling an attractive business environment for potential investors during the transition since the 1990s. In addition, Ukraine still recognizes treaties of the USSR with Spain, Malaysia and Japan, which have not been renegotiated.

Foreign-owned companies, while constituting a smaller share than in neighboring countries, still play an important economic role and are major actors in agribusiness, banking, consumer products, retail and telecommunication (OECD, 2015). However, a large portion of recorded foreign investment into Ukraine is likely the result of local funds being channeled and subsequently returned back to Ukraine in the form of direct investment (round-tripping). This might explain the high share of investments originating from

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5 Mongolia, for instance, cancelled DTT’s with Kuwait, Luxembourg, the Netherlands and UAE in 2012. See: Michielse, G. (2012).
6 The constitution does not provide explicit guidance on the hierarchy between laws, but prevails in case of conflict. International treaties that are in force, agreed to be binding by the Verkhovna Rada of Ukraine, are part of the national legislation of Ukraine.
7 Article 3.2 of the Ukrainian Tax Code.
8 Other DTT’s concluded before 1990 were subsequently revised.
conduit jurisdictions/offshore financial centers (OFCs), such as Cyprus. Ukraine’s tax treaty with Cyprus has received increasing political and public attention in Ukraine over the past decade. A large share of Ukrainian businesses have immediate shareholders in Cyprus. Cyprus accounted for almost 30 percent of FDI inflows and more than 90 percent of FDI outflows in 2015 according to the State Statistical Service (2015).

Renegotiation of the original Cyprus-USSR agreement led to a number of revisions to the treaty in 2012 (which entered into force in January 2014). These amendments include an increase of withholding tax rates and the introduction of the beneficial ownership concept for dividends, interest and royalties. Some of these revisions were recommended as steps to protect the Ukrainian tax base. Nonetheless, Cyprus maintains a preferential status, and the treaty continues to draw attention from policy makers.

While Ukraine’s first treaties were concluded mainly with current OECD member states and other former Soviet countries, recent growth in the treaty network was driven by non-OECD members. Notably, several treaties are in place with low tax and/or common conduit jurisdictions for investors in the region. Ukrainian policy makers have started to renegotiate treaties with several of these jurisdictions.

Figure 1. Development of the Ukrainian tax treaty network

Data Source: IBFD

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11 A revised treaty is currently pending approval in the Ukrainian parliament. It has the following withholding rates: Dividends – 5% / 10%; Interests – 5%; Royalties – 5% / 10%.

12 For instance, a protocol, amending DTA with Luxemburg to increase applicable withholding rates was signed on September 30th 2016.
2.2 Foregone taxing rights – the development of treaty withholding tax rates

In Ukraine, as in most other countries, dividend payments, interest and royalty flows are taxed through withholding instruments. The general domestic withholding rate for the three types of passive income from Ukrainian sources paid to non-resident entities is 15%.

Double tax treaties typically limit these rates with respect to cross-border income and transactions. Figure 2 below illustrates the evolution over time of the withholding tax rates applied by the double tax treaties entered into by Ukraine, for dividends, interest and royalties. The left column summarizes the normal rate applied, and the column to the right captures special rates, such as rates for qualifying companies with a certain participation in a subsidiary, or loans by state-owned financial institutions. The circles’ size represents the number of treaties signed in a given year. Over the past decades, withholding rates in Ukraine’s treaties have been increased in treaty negotiations, the exception being the dividend’s alternative rate for qualifying non-portfolio investment. The alternative rate for qualifying dividend and interest income remains below the rates suggested in the OECD model convention.

Figure 2: Development of withholding tax rates for newly signed treaties

Note: Line depicts a polynomial time trend.

Data Source: IBFD (2016)
**Dividends**

In several of its DTT’s, Ukraine agreed to dividend withholding tax rates that are below the rates suggested by the OECD model convention (15%). Several former treaties also included a zero percent withholding tax, thus effectively removing Ukraine’s taxing right on dividends paid to non-residents. For instance, a general dividend withholding rate at zero percent in the treaty with Cyprus was only renegotiated in 2012.

**Figure 3: Dividend withholding rates in Ukrainian tax treaties**

![Graph showing dividend withholding rates in Ukrainian tax treaties](image)

*Data Source: IBFD (2016)*

There are still scenarios where no withholding tax applies to Ukrainian dividend distributions. One example is a structure in which the distributing company is Ukrainian and the beneficial owner (not a partnership) of the dividends is Dutch. As long as the capital investment is insured by the Dutch government, Central Bank, or any agency owned or controlled by the Dutch government, Ukraine has no right to tax the dividend distribution, regardless of the participation share of the recipient. Similar rules are found in the treaty with France, with the difference that, if insured by the government, there is no beneficial ownership requirement. The treaty with the UK requires that the recipient of the dividends not only is the beneficial owner of the income but that it is also subject to tax.

The additional requirements for the reduced dividend withholding tax rate vary from treaty to treaty. Most of them also explicitly exclude partnerships from being entitled to the more beneficial rate, although not all demand a direct participation. The treaties with Cyprus,13 France and the Netherlands (for certain situations) envisage entitlement to partnerships as well.

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13 Article 2 of the 2015 double tax treaty protocol will be effective in 2019 and explicitly excludes partnerships from the more favorable withholding rate.
Public tax planning suggestions by private tax advisory firms illustrate the potential attractiveness of low dividend withholding tax rates for foreign investors in Ukraine. Publicly advertised private advice for business arrangements commonly draws on the treaty between Cyprus and Ukraine,\(^{14}\) often in combination with references to agreements of Cyprus and the Netherlands and/or Malta.\(^{15}\)

**Interest**

The OECD suggests in its Model Convention that a withholding rate of 10% is applied to interest payments. Similar to dividend distributions, the Ukrainian network includes a number of DTT’s with important commercial partners where a zero withholding rate can be applied (interest paid to or guaranteed by a government or one of its agencies). While the share of treaties with no withholding taxation for qualifying (alternative) interest payments decreased since the 1990s, the number grew in absolute terms (Figure 4).

**Figure 4: Interest withholding rates in Ukrainian tax treaties**

![Figure 4](image)

**Data Source: IBFD (2016)**

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\(^{14}\) The most basic approach is a simple conduit structure for dividend payments. In this scenario, the parent company would establish a subsidiary in Cyprus, which would then establish another subsidiary company in Ukraine. As long as a minimum investment requirements of 100,000 EUR and 20% shareholding are met, dividend payments face a reduced rate of 5% withholding tax in Ukraine. Corporate income tax levels in Cyprus are considerably lower than most countries and, additionally, there is no tax withheld by Cyprus on further dividend payments.

\(^{15}\) The treaty between the Netherlands and Ukraine permits the payments of dividends free of withholding tax, should the Dutch parent control at least 50% of the shares of the Ukrainian subsidiary and invest at least EUR 300,000. At the Dutch level, due to the participation exemption regime, there is no applicable corporate income tax. Moreover, as a result of the Parent-Subsidiary Directive, dividends can be distributed within the European Union without being subject to withholding tax. In Malta, there is the possibility to qualify for full tax refund or full tax exemption. With respect to any eventual disinvestment or sale of business, there would be no taxation at any level, except if connected to real estate.
The treaty between Ukraine and Cyprus provides for commonly advertised opportunities to minimize taxation of interest payments. A 2% withholding tax rate applies to interest payments originating in Ukraine and going to Cyprus.\(^1\)

**Royalties**

Following the OECD model treaty, the country of residence of a recipient should be able to tax the payments related to royalty income. The weak policy rationale for this approach has been criticized by many observers.\(^2\) Notably, potential direct costs of foregone revenue on royalty payments are likely increased by indirect effects. The importance of remuneration for intellectual property in driving global profit shifting dynamics has been well documented, and so are the challenges of countering this shifting channel (Beer and Loeprick, 2015).

The Ukrainian double tax treaty signed with the UK follows the OECD rationale and allows for a zero withholding tax rate applicable to royalty payments – provided the recipient is beneficial owner and is subject to tax. Although closer to the United Nations Model Double Taxation Convention approach, which generally favors source taxation, the double tax treaties entered into with the Netherlands, Germany, Austria,\(^3\) UK, France, and Switzerland also include provisions allowing for a 0% withholding tax rate. In the current treaty with Cyprus, payments from Ukraine would be subject to either a 5% or a 10% withholding rate, depending on the industry and type of licensing arrangement.

**Figure 5: Royalty withholding rates in Ukrainian tax treaties**

\(^1\) This rate has been renegotiated to 5%, but the revisions have not yet been approved in parliament.
\(^2\) Brook and Krever (2015), for instance, discuss that assumed benefits of cost reductions for domestic users of intangibles sourced from abroad are questionable, while profit shifting risks using royalty charges are exacerbated.
\(^3\) Similar to the Ukraine-Germany and Ukraine-Austria treaty Article 12(3) and 12(5)(b) of the Netherlands-Ukraine DTT states that the taxation rights are exclusive for residence taxation if the term "royalties" means payments of any kind received as a consideration for the use of, or the right to use any copyright of scientific work, any patent, trade mark, design or model, plan, secret formula or process, or for information concerning industrial, commercial or scientific experience.
Data Source: IBFD (2016)

In light of the importance of specific DTT’s for tax planning arrangements, the depiction of average rates in Figure 2 above does not reveal much about the relative importance or potential impact of different treaties concluded by Ukraine. Combining information on applicable withholding rates with company ownership information, presented in section 3 below, allows us to get a better sense of the relative economic weight of negotiated treaty rates.

Figure 6 summarizes the average withholding tax rate (green lines) and then provides a weighted average using the number of affiliated companies resident in each of the treaty partner jurisdictions, presented by the purple lines. Notably, the weighted withholding rates are inferior to the general average and also tend to be lower than the reference rates suggested by the OECD in its model convention.\(^\text{19}\)

**Figure 6: Weighted withholding rate average of Ukrainian tax treaties**

Data Source: Bureau van Dijk - ORBIS (2016), IBFD (2016)

\(^{19}\) The exception is royalty income given the OECD’s suggestion of exclusive taxing rights for the country of residence of the company receiving the payments.
2.3 An overview of dividend, interest and royalty flows

In this section we provide a brief summary of payment flows from Ukraine over the past decade. Figure 7 depicts aggregate international income flows between 2005 and 2015 for dividends, interest and royalties.\(^2^0\) The Ukrainian net income balance was negative with more outflows than inflows throughout the entire period and peaked at roughly USD 7.5 Billion in 2013. Subsequently, dividend outflows dropped sharply as a result of ban on dividend repatriation, following the currency shock in late 2014. Similarly, royalty interest and inflows increased substantially and decreased after 2013.

*Figure 7: Primary Income Balance*

Source: Central Bank (2016)

Figures 8 and 9 below present more detailed pictures of income flows, differentiating between ten major recipient countries of Ukrainian payments. The primary recipient of Ukrainian payments was Cyprus, with interest and dividend payments growing strongly until 2013 and declining thereafter. The withholding tax rate on dividend and royalty payments to Cyprus increased in 2012, following treaty renegotiations, which may have contributed to the decline.

Outflows to the Netherlands were dominated by shareholder compensation (dividends), the magnitude of which was, in some years, comparable to the outflow to Cyprus. With a larger share of interest payments in total outflows, payments to Russia were less volatile. Royalty payments from the UK resulted in a reduced income deficit in the years 2013 and 2014. Otherwise, the net income position remained fairly stable between Ukraine and the UK, and was dominated by interest payments. Switzerland and the US are major beneficiaries of Ukrainian royalty payments, likely holding important intangible assets sourced by Ukrainian entities.

\(^{2^0}\) Based on Central Bank information provided in January 2016. The graph differentiates between inflows, outflows (negative values) and net values (represented by a point).
These graphs suggest that major shareholders of Ukrainian firms are located in Cyprus, the Netherlands, Switzerland and the US, while debt is primarily issued in Russia, the UK, Austria, and France. The ban on dividend repatriation following the currency shock in late 2014 had a notable impact on the balance of dividend flows. Dividend outflows grew steadily (14.7% p.a. on average) between 2005 and 2013, when they attained a maximum of more than US$ 3 billion, before falling back to slightly more than US$ 1 billion and ceasing altogether in 2015. With more than US$ 2.5 billion in 2013, shareholders located in Cyprus seem to have been the largest beneficiaries of dividend repatriation.

Interest outflows increased from slightly less than US$ 0.5 billion in 2005 to more than US$ 3 billion in 2013. Subsequently, outflows almost halved, likely due to the currency crises starting in late 2014. Cyprus was the main driver of the observed trend. Payments to Cypriot lenders alone reached more than US$ 1.5 billion in 2013, before falling back to roughly US$ 0.7 billion in 2014.

*Figures 8, 9: income flows with major recipient countries of Ukrainian payments*
In contrast to dividend and interest payments, the remuneration of intellectual property was not adversely affected by the currency shock in 2014. Inflows rose sharply to US$ 1 billion between 2013 and 2014 before reverting to their prior level of roughly US$ 2 million. Russian and British residents accounted for the notable inflows between 2013 and 2014. Outflows decreased from about US$ 500 million before 2014 to US $ 250 million in 2015. The major beneficiaries of Ukrainian royalty payments are Switzerland, the United States, and Germany.

3. Direct treaty costs and the revenue impact of changes in withholding rates

3.1 Measuring the direct response to withholding rate changes

A review of dividend, interest and royalty flows allows an initial approximation of the cost (in foregone withholding tax revenue) of treaty driven taxing right limitations. Increasing or lowering the withholding tax rate with a partner country impacts tax revenue in two ways. First, there is a mechanical effect caused by the application of a higher rate on the existing base. Second, the tax base adjusts as well. For instance, while income streams to a partner country might be lower after an increase in the applicable withholding rate, income streams with other countries, absorbing some of these flows, potentially increase.

The mechanical revenue effect of tax treaty withholding rates is a result of multiplying payment streams to a country by the differential of the applicable general withholding tax rate and the rate negotiated in the country specific treaty. A complication here is to differentiate flows that qualify for alternative rates based on treaty provisions. Notably, following the most recent treaty revision with Cyprus, the treaty withholding rate for portfolio investment matches the generally applicable rate of 15%. Substantial shareholders do, however, qualify for a reduced rate of 5%. Flows to portfolio and non-portfolio investors thus need to be differentiated in the approximation of foregone tax revenue on dividends.
According to information obtained from the Central Bank the share of dividends paid to portfolio investors remained on average below 5 percent of all dividend payments to Cyprus during the period from 2005-2015. Similarly, the shares of portfolio investments for the Netherlands, Russia, the UK, Austria, Switzerland, the US, France, and Germany and Sweden average stood below 5%. Given differences in portfolio and non-portfolio investor definitions across DTT’s and the Central Bank classification we assume that just about 80%22 of dividend payments qualify for the non-portfolio rates stipulated in treaty provisions.

3.2 Measuring the behavioural response to withholding rate changes

We attempt to quantify behavioral responses to changes in withholding taxation by looking at historical variation in Ukrainian treaty provisions. This variation is limited and largely driven by new treaty formation,23 leading to important imprecisions of our results as discussed further below.

Combining information on (limited) variations with administrative information on income flows, we estimate the magnitude of country-specific dividend, royalty and interest payments, conditional on the structure of the withholding tax regime. To derive estimates on the impact of a partial tax reform, we assume that income flows with partner country i, denoted I(i), are functions of the entire set of withholding tax rates, $\{T(1),T(2)\ldots T(n)\}$. Governmental income accruing from the taxation of capital transfers is thus given by $R = \sum_{i=1}^{n} T(i) I(i)$. We are interested in the impact of a small change of tax rate $T(k)$. Using the above notation, this reads:

$$dR = I(k) dT(k) + \sum_{i=1}^{n} T(i) dI(i).$$

The first term represents the mechanical effect. Its magnitude is readily available by combining information on current capital transfers with the hypothesized reform, $dT(k)$. The second term accounts for a behavioral response. Quantification of this indirect response requires estimates of the sensitivity of the tax base, $dI(i)$. To arrive at these estimates, we assume that own- and cross-price elasticities are different but constant across partner countries, so that a linearized version of income stream $I(i)$ reads:

$$\log I(i) = a \cdot T(i) + b \cdot D(i) + m(i)$$

Here, the first coefficient represents the own-price semi-elasticity: income streams to partner country i decrease by a percent in response to a one percentage point increase in the withholding tax rate to partner country i. The second coefficient is given by (N-1) times the cross-price semi-elasticity. In contrast to the own-price elasticity, it is expected to take a positive sign due to substitution effects. The variable $D(i)$

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21 Please note that the definitions of the Central Bank do not always correspond to the definition of the ownership threshold for the non-portfolio investments specific in each treaty. In DTT’s the rates differ between 10%, 20%, 25%, or 50%, depending on the specific provisions. For instance, the treaties with: Cyprus requires 20% shareholding; with Austria the requirement is 10%; while the UK requires at least 20% of the (direct or indirect) voting powers.

22 This estimate of 80% thus being fairly conservative, with the average of dividends to portfolio investors being below 5 percent of total payments.

23 During our sampling period, rates for the treaty with Cyprus were revised in 2012 and with Norway in 2008. New treaties were concluded with Iceland (2006), Jordan (2005), Libya (2008), Mexico (2012), Montenegro (2007) and Singapore (2007).
is a weighted average\textsuperscript{24} of withholding tax rates applied with partner countries other than \( i \) and the country-specific effect, \( m_i \), summarizes constants. When interpreting the regression results, we use \( dI(k) \approx a \cdot I(k) dT(k) \), \( dI(i) \approx b \cdot I(i) dD(i) \) and combine the above relations to obtain estimated revenue effects.

To operationalize this approach, we estimate own- and cross-tax elasticities for dividend, interest, and royalty payments jointly in a seemingly unrelated regression framework

\[
\log y_{itm} = c(m) + a(m) \cdot T_{itm} + b(m) \cdot D_{itm} + Time(mt) + e_{itm}
\]

where the indices \( i, t, \) and \( m \) indicate countries, time, and income measures, respectively. Income-specific constants are captured by \( c(m) \). Furthermore, we introduce a full set of time dummies, represented by \( Time(mt) \), to capture macro-economic events such as the currency shock in late 2014 and the ensuing ban on dividend repatriation. Our dependent variables are outflows of dividend, royalty, and interest payments from Ukraine to 155 partner countries, with the years 2004 until 2014 covered.

As we allow own- and cross- price elasticities to vary across payment types, the system of equations depicted above is seemingly unrelated. However, by estimating the specifications jointly, we may test restrictions across elasticities and, more importantly, exploit efficiency gains. Specifically, we account for income-specific, country-specific and idiosyncratic components in the error structure:

\[
e_{itm} = m(mi) + n(i) + v(itm)
\]

Table 1 below reports our estimation results. In the first, third, and fifth column, we estimate the impact of withholding taxation on dividend-, interest-, and royalty outflows, respectively. The results suggest that increasing the tax rate with a specific country, tends to reduce income flows to this country. We find the largest own-price semi-elasticity for royalty payments: a one percentage point increase in royalty withholding reduces income flows to the affected country by more than 12 percent. With an estimated sensitivity of 3 and 6 percent, dividend and interest payments seem to be less responsive to taxation. The second line reports estimates for cross-tax elasticities. As expected, these take positive signs, implying that an increase in the withholding taxation of income payments to other countries exerts a positive influence on income flows to the specific country considered.

\textit{Table 1: Estimation results on WHT elasticity}

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Dividend payments</th>
<th>Interest payments</th>
<th>Royalty payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHT rate of country ( i )</td>
<td>-3.14 (5.36)</td>
<td>-6.25* (4.80)</td>
<td>-12.37*** (2.64)</td>
</tr>
<tr>
<td>WHT rate of other countries</td>
<td>38.26* (29.43)</td>
<td>175.32** (104.76)</td>
<td>20.72 (44.24)</td>
</tr>
</tbody>
</table>

\textsuperscript{24} If cross price elasticities are actually constant, weights are given by \( 1/(N-1) \). In the empirical application, we assume that weights are determined by the relative importance of partner countries, as represented by income streams in 2014.
\[ a + r^*b = 0 \]

Estimates on the covariance structure suggest that around 40 percent of the unexplained variation is related to partner-country specific factors while a third is related to measure-specific factors. Although we incorporate this information in our estimation approach, the coefficients are estimated with major imprecision, likely owing to the limited variation in tax rates and multicollinearity. The observed magnitude of the estimates reported in columns (1), (3), and (5) is unconvincing. It suggests an increase in the overall tax base as a result of a country level increase in the withholding rate. We therefore introduce an additional restriction to enhance the plausibility of our estimates.

Specifically, we incorporate the assumption that an increase in any tax rate does not increase the overall tax base of the affected income measure. Intuitively, the overall tax base does not increase in response to policy changes if the (negative) own-price elasticity exceeds the (positive) cross-price elasticity - the substitution effect. A sufficient condition for this requirement can be stated as the linear restriction \( a + r^*b = 0 \), where \( r \) is the ratio of average capital transfers to other countries, relative to capital transfers to some country with the smallest such transfers.

We incorporate the restriction in columns (2), (4) and (6), by replacing the tax variables with a combined rate, defined by \( T(\text{itm}) = \frac{1}{r(m)} \ast D(\text{itm}) \), and using the ratios \( r(\text{div}) = 1.58 \), \( r(\text{int}) = 16.71 \) and \( r(\text{roy}) = 1.60 \), which are based on income flows in 2014. The implied own price semi-elasticities are close in magnitude to own-price elasticities estimated before. Cross-price elasticities then follow from the restriction. We use these in the calculation of revenue effects in the following sub-section.

### 3.3 Direct revenue effects of WHT rate reductions

Our estimation results presented above suggest strong own- and cross-tax elasticities, meaning that income flows with all partner countries respond to changes in the withholding tax rate with any one specific country. More specifically, we find that country-specific income flows tend to decrease following an increase in the relevant withholding tax rate. This effect reduces the simple mechanical revenue gain

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25 The measure-specific error component in royalty outflows is estimated to be marginally negative. We thus restrict this component to zero in estimating other error components.

26 Using linearized income streams, the condition of no-tax-base-increase in response to higher tax rates translates into: \( [a \ast l(k) + b \ast \frac{1}{N-1} \sum_{i \neq k} I(i)] \ast dT(k) \leq 0 \) in the case of constant cross price elasticities. From this, the sufficient condition \( a + r^*b = 0 \) follows with \( r = \frac{\sum_{i \neq k} I(i)}{N-1} \). We use a weighted average in our empirical application.
one would expect from renegotiating a withholding rate at a higher level. The results also suggest that after withholding rates with a country increase, some of the income flows to this country are redirected to other countries. The share of flows that are redirected and the share that is discontinued thus shape the overall sensitivity of the withholding tax base and the efficiency of tax policy changes. Finally, these results suggest that the base of royalty payments and interest flows react strongly to any changes, while dividend flows are less sensitive. Accuracy and magnitude of revenue estimates based on these elasticities are, however, subject to a number of assumptions and need to be interpreted with caution.27

Tables 2a and 2b below translate our findings into an estimate of revenue losses linked to reduced dividend payments for the five most important recipient countries. (Cyprus, Netherlands, Russia, United Kingdom, Austria, and Switzerland). The tables differentiate the mechanical and behavioural effects described above and report the estimated potential revenue impact of partial reforms of the withholding tax structure based on 2012 and 2014 data. In each row we examine what would happen if the current treaty based withholding tax rate with a specific country was reset to the domestic level of 15%. The mechanical effect is presented in the column on “Direct Effect” and the column named “Total Effect” combines the mechanical and behavioural effects. The table indicates, for instance, that parents in the Netherlands received from Ukraine more than US$400 million in dividends in 2014. If the withholding tax rate had been reset to 15%, the mechanical increase in revenues would have been around US$60 million. However, a share of the flows would likely have been redirected. Our estimates indicate that roughly 80% of the initial increase would remain.

Table 2a: Estimated revenue loss from reduced withholding on dividends (2014)

<table>
<thead>
<tr>
<th>Country</th>
<th>Flow in 2014</th>
<th>Differential</th>
<th>Direct Effect</th>
<th>Total Effect</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total non-portfolio dividend flow28 (Million USD)</td>
<td>of qualifying rate with standard withholding</td>
<td>Tax revenue foregone (Million USD)</td>
<td>Tax revenue foregone (Million USD)</td>
<td></td>
</tr>
<tr>
<td>Cyprus</td>
<td>175.95</td>
<td>0.10</td>
<td>17.59</td>
<td>14.49</td>
<td>0.82</td>
</tr>
<tr>
<td>Netherlands</td>
<td>416.40</td>
<td>0.10</td>
<td>41.64</td>
<td>34.14</td>
<td>0.82</td>
</tr>
<tr>
<td>Russia</td>
<td>71.44</td>
<td>0.10</td>
<td>7.14</td>
<td>6.01</td>
<td>0.84</td>
</tr>
<tr>
<td>Austria</td>
<td>77.03</td>
<td>0.10</td>
<td>7.70</td>
<td>6.46</td>
<td>0.84</td>
</tr>
<tr>
<td>Switzerland</td>
<td>73.79</td>
<td>0.10</td>
<td>7.38</td>
<td>6.20</td>
<td>0.84</td>
</tr>
<tr>
<td>Mean</td>
<td>162.92</td>
<td>0.10</td>
<td>16.29</td>
<td>13.46</td>
<td>0.83</td>
</tr>
</tbody>
</table>

27 Most importantly, we impose a specific balance of own- and cross tax elasticities to ensure that our results are economically meaningful (we require that the aggregate tax base does not increase in response to an increase in any withholding tax rate)

28 Assumed to be 80% of total flow.
Note: The table summarizes estimates of revenue losses from reduced dividend payments for the 5 most important recipient countries in 2014. The table presents an estimated revenue impact of resetting withholding tax rate with a specific country to the domestic level of 15%.

Data Source: Central Bank

In table 2b we report estimated effects for the year 2012 to allow for a comparison of effects before the dramatic drop in dividend outflows as a result of ban on dividend repatriation following the currency shock in late 2014. Revenue implications in 2012 are more dramatic. However, the relative efficiency—the total effect as a share of the direct effect—is similar across both years, we estimate that roughly 80% of any mechanical increases would have ended up as additional government revenue.

Table 2b: Estimated revenue loss from reduced withholding on dividends (2012)

<table>
<thead>
<tr>
<th>Country</th>
<th>Flow in 2014</th>
<th>Differential of qualifying rate with standard withholding</th>
<th>Direct Effect Tax revenue foregone (Million USD)</th>
<th>Total Effect Tax revenue foregone (Million USD)</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyprus</td>
<td>948.02</td>
<td>0.10</td>
<td>94.80</td>
<td>77.33</td>
<td>0.82</td>
</tr>
<tr>
<td>Netherlands</td>
<td>516.64</td>
<td>0.10</td>
<td>51.66</td>
<td>42.36</td>
<td>0.82</td>
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<td>Russia</td>
<td>113.37</td>
<td>0.10</td>
<td>11.34</td>
<td>9.62</td>
<td>0.85</td>
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<td>Austria</td>
<td>63.30</td>
<td>0.10</td>
<td>6.33</td>
<td>5.55</td>
<td>0.88</td>
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<tr>
<td>Switzerland</td>
<td>47.05</td>
<td>0.10</td>
<td>4.70</td>
<td>4.24</td>
<td>0.90</td>
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<tr>
<td>Mean</td>
<td>337.67</td>
<td>0.10</td>
<td>33.76</td>
<td>28.70</td>
<td>0.85</td>
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</tbody>
</table>

Data Source: Central Bank

We repeat this exercise for the main recipients of interest flows and royalty payments in 2014, applying the same approach. Given that we cannot differentiate between flows potentially qualifying for a lower rate, we only refer to the higher standard rate stipulated in each treaty.

Table 3: Estimated revenue loss from reduced withholding on interest (2014)

<table>
<thead>
<tr>
<th>Country</th>
<th>Flow in 2014</th>
<th>Differential with standard withholding</th>
<th>Direct Effect Tax revenue foregone (Million USD)</th>
<th>Total Effect Tax revenue foregone (Million USD)</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyprus</td>
<td>613.65</td>
<td>0.13</td>
<td>79.77</td>
<td>21.72</td>
<td>0.27</td>
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</table>

29 We also present tables for royalty and interest flows in 2012 in the Annex.
30 Assumed to be 80% of total flow.
### Table 4: Estimated revenue loss from reduced withholding on royalties (2014)

<table>
<thead>
<tr>
<th>Country</th>
<th>Flow in 2014 Royalties (Million USD)</th>
<th>Differential with standard withholding</th>
<th>Direct Effect Tax revenue foregone (Million USD)</th>
<th>Total Effect Tax revenue foregone (Million USD)</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyprus</td>
<td>62.77</td>
<td>0.05</td>
<td>3.14</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Russia</td>
<td>40.09</td>
<td>0.05</td>
<td>2.00</td>
<td>0.39</td>
<td>0.20</td>
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<tr>
<td>UK</td>
<td>85.55</td>
<td>0.15</td>
<td>12.83</td>
<td>3.07</td>
<td>0.24</td>
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<tr>
<td>Switzerland</td>
<td>84.40</td>
<td>0.05</td>
<td>4.22</td>
<td>-0.31</td>
<td>-0.07</td>
</tr>
<tr>
<td>US</td>
<td>59.87</td>
<td>0.05</td>
<td>2.99</td>
<td>0.08</td>
<td>0.03</td>
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<tr>
<td>Mean</td>
<td>66.53</td>
<td>0.07</td>
<td>5.04</td>
<td>0.65</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Data Source: Central Bank

Our estimates suggest, for instance, that resetting the withholding tax rate on interest payments to Cypriot lenders could result in almost US$ 80 million in additional revenues. However, in the long run, financing would likely be restructured and originate from other countries and we estimate that only 27% of the initial increases of an isolated increase in the rate with a specific country would persist. For royalty payments, for which zero withholding rates are most common, this effect is even pronounced. The ratio of total revenue increases as a share of mechanical effects is just 8% on average.

### 4. An investigation of indirect costs and treaty abuse

Treaty based withholding rates likely affect government revenues both directly and indirectly. As presented above, the direct effect may be an increase in revenues due to a change in the applicable tax rate. Indirectly, a change in withholding tax rates may also change the costs of shifting income abroad.
when using debt financing or charges for the use of intellectual property and disproportionate interest or royalty payments may decrease the reported pre-tax profitability of MNE affiliates operating in Ukraine.

A growing body of evidence indicates that multinational enterprises (MNEs) exploit intra-group transactions to reduce their corporate tax liability (Heckemeyer and Overesch, 2013, Beer and Loeprick 2015). These tax planning strategies often involve the cross-border provision of intellectual property and intra-group financing. By acquiring goods and services, tax-deductible expenses of domestic entities can be inflated and earnings of affiliates can be increased. Given that the economic value of intellectual property, the appropriate magnitude of and remuneration for intra-group lending, or the long term return on management services is often difficult to determine, these transactions can provide an opportunity to reallocate profit.

While reducing the domestic corporate tax base, interest-, royalty-, and service fee payments are also taxed domestically. Unless double tax treaties stipulate otherwise, withholding taxes of 15 percent are levied on the gross income payments to foreign entities, increasing the effective costs of intra-group transactions and thus limiting the incentive to engage in tax arbitrage. Accordingly, withholding taxation can act as 'a second line of defense' in safeguarding the domestic tax base, especially when administrative capacity is limited or the scope of anti-abuse provisions is narrowly defined.

In order to get a better indication of treaty related tax planning and potential profit-shifting from Ukraine, we exploit information on group structures and performance indicators of more than 5000 Ukrainian MNEs to examine profitability, and leverage ratios among Ukrainian MNEs. More specifically, we rely on available locational information on the MNE group structure to determine the relevant set of withholding tax rates for each firm in the sample to estimate the impact of withholding tax rates on reported firm level performance.

4.1 Data and sample description

Our analysis in this section is based on Bureau van Dijk’s ORBIS database, offering administrative information for more than 50 million private and public companies globally. The data is collected by national institutions based on legal requirements and compiled and standardized by Bureau van Dijk. As of January 2016, ORBIS covers over 300,000 Ukrainian firms with unconsolidated accounts, providing balance sheet and profitability information for the years 2006 until 2014 as well as information on corporate group structures.31

We consider firms to be a multinational enterprise if they either own, or if they are owned by, at least one foreign affiliate with a total ownership-share of at least 20%. Following this definition, the majority of Ukrainian firms are not part of MNEs. We drop purely domestic firms from the sample. To avoid potential biases caused by influential and/or unusual observations, we perform a sequence of data cleaning steps. Specifically, we drop firms with unknown or excessive profitability level and 5% of the sample lying at the extremes of the distribution (in terms of profitability, size, or reported intensity on the use of intangible

31While a related information provider (Zephyr) allows tracing back recent mergers and acquisitions, there is little such information on Cypriote firms. Given that the majority of firms are affiliated to companies in Cyprus, the picture drawn by this analysis is static.
assets). Finally, we limit the dataset to firms with non-negative sales and liabilities. Following these data cleaning steps, the baseline sample comprises 5,113 MNEs. Table 5 summarizes the sample selection.

**Table 5: Sample Selection**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Firms in sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Downloaded from ORBIS</td>
<td>309,630</td>
</tr>
<tr>
<td>2</td>
<td>Drop domestic firms</td>
<td>5,333</td>
</tr>
<tr>
<td>3</td>
<td>Drop outliers</td>
<td>5,113</td>
</tr>
</tbody>
</table>

*Source: ORBIS 2016 (January)*

For each MNE in the baseline sample, we record the number and location of affiliated companies and the location of its global ultimate owner. Around 90% of our sample is controlled from abroad. More than 20% of the firms in our sample are controlled from Cyprus. Other important locations of controlling shareholders' countries include Russia, Germany, the British Virgin Islands, USA, UK, Netherlands, Austria and Poland. We cannot clearly identify the global ultimate owner for roughly 15% of the sample because of shared ownership structures.

To further examine the impact of group structures, we assign each Ukrainian firm to at least one foreign country if either the controlling shareholder, or a controlled subsidiary, are located there. Over 30% of the sample exhibit a direct link to Cyprus (1,697 out of 5,312), either through a controlling shareholder or a controlled subsidiary. This number includes companies which are operating in Cyprus and Ukraine only (1,219 firms) and MNEs operating in more than two countries. The most frequent corporate group structures among the latter group include: Ukraine-Cyprus-Luxembourg (76 firms), Ukraine-Cyprus-British Virgin Islands (72 firms), and Ukraine-Cyprus-Netherlands (70 firms).³²

We do account for the details of these group structures when estimating the impact of withholding tax rates on firm-level variables. Specifically, when a Ukrainian MNE is affiliated with companies in more than one country, we proxy for the effective withholding tax rate by taking the lowest of the tax rates applicable under the set of relevant double tax treaties.

Besides Cyprus, which seems to be part of most group structures, we find a high concentration of ownership links between Ukrainian MNEs and foreign entities in the following countries: Russia (435 firms), the Netherlands (402 firms), Great Britain (396 firms), Germany (371 firms), British Virgin Islands (333 firms), USA (256 firms), Poland (230 firms), Austria (229 firms), and Luxembourg (207 firms).

Figure 10 summarizes the relative importance of industries across Ukraine’s major partner countries. For each major partner country identified above, the circle size represents the share of firms operating in a

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³² These figures do not differentiate the number of affiliated companies of a specific MNE in a country. The presence of one or multiple firms of the same corporate group in one foreign country is recorded as one direct relationship to this country.
specific industry, relative to the average industry share among Ukrainian MNEs. Numbers above one indicate a higher concentration of a particular industry within the subsample of firms considered.

**Figure 10: Industry structure of Ukrainian MNEs**

Notes: For each country, circles depict share of MNEs operating in a specific industry, relative to the average share of Ukrainian MNEs operating in this industry. Numbers above one thus indicate above average industry concentration.

Data Source: Orbis (2016)

The graph (first row) shows that groups with an affiliate in Cyprus are nearly two times as likely to operate in the agricultural sector, compared to an average Ukrainian MNE. The likelihood of operating in the real estate or financial sector is 30% higher. Groups with Russian affiliates (second row) are concentrated in information and communication industries (+40%), the construction sector, and professional, scientific and technical activities (+30% each).

The third row shows that the industry distribution of MNEs with an affiliate in the Netherlands is, with a high concentration of agricultural firms, surprisingly similar to the one of MNEs with a Cypriote affiliate. Other notable deviations from the baseline distribution include MNEs with UK affiliates (+90%) in the transportation sector, the information and communication intensity among MNEs with affiliates in the

---

33 More formally, the circle size (and number) represent the ratio $x_A/x$, where the average share of multinational firms operating in an industry is given by $x$ while the respective share of firms with an affiliate in country $A$ is given by $x_A$.

34 Substantial deviations reported among non-Cypriote MNEs must be partly attributed to the small sample size, rendering unusual empirical distributions more likely.
USA (+110%), Austrian real estate and financial firms (+110% and +210%), and the agricultural intensity of MNEs with affiliates in Luxembourg (+400%).

4.2 Empirical analysis

We start our analysis from the premise that an MNEs’ incentive to shift profits is inversely related to the level of withholding taxation. Where domestic withholding taxation applies to cross-border interest-, royalty-, or service fee payments, the potential tax advantage of lower corporate income taxation abroad is reduced. Double taxation agreements thus likely affect reported firm profitability by altering the financial structure, the provision/use of intellectual property, or the use of internal services. We link group structure information with firm-level variables to investigate this premise.

The following regression specification summarizes two related hypotheses:

$$y(it) = \beta Withholding(it) + X(it)'\gamma + \mu(i) + \varepsilon(it)$$

The dependent variable $y(it)$ varies over time $t$ and firms $i$. It is either (a.) the return on assets (profit over tangible assets), or (b.) the leverage ratio (debt over tangible assets) of Ukrainian MNEs. The main explanatory variable, withholding, is the relevant withholding tax rate which varies across observations in accordance with the location of affiliated companies.

We expect withholding taxation to exert a positive influence on firm profitability by reducing the incentive to shift profits abroad. Accordingly, the coefficient on the withholding tax rate should take a positive sign when using the return on assets as dependent variable. The underlying mechanisms are twofold. First, withholding taxation on interest payments decreases the tax benefit of debt financing. For instance, by applying a high rate of withholding to interest payments to a related entity in a low tax jurisdiction, the return to shifting profits out of Ukraine decreases. We thus expect higher withholding taxation to impact the leverage ratio of MNEs in Ukraine negatively. The second mechanism works through the use of intellectual property. If royalty payments are taxed when crossing the border, the benefit of relocating profit using excessive royalty charges is reduced.

Ukraine’s withholding tax rates on royalty- and interest payments are highly correlated (around 0.8). To avoid multicollinearity, we use an average of these rates as an explanatory variable. Furthermore, to account for MNEs’ affiliation with several partner countries, we proxy for the relevant withholding tax rate by taking the minimum of the applicable tax rates. Limited variation in withholding tax rates between 2006 and 2014 limits our control for arbitrary correlation between unobserved effects at the firm level.

![Variation in withholding tax rates is limited thus complicating tests for reverse causality. Withholding tax rates, however, are less flexible and determined by the negotiators of two countries with competing interests on a range of policy objectives.](image)
and for our explanatory variables. To reduce the potential of endogeneity, we include a range of control variables in \( X \).

**Performance ratios and MNE links to partner countries**

We first examine the impact of DTTs graphically by depicting firm-specific variables conditional on corporate group structures. Figure 12 and 13 below illustrate the average development of the return on assets and the leverage ratio of MNEs with an affiliate in a specific country (dark blue line) and a control group (light blue line) of comparable firms without a link to this country.

Selection of the control group is based on propensity score matching, with tangible asset-, industry-, and employee information used as explanatory variables. Firms in the experimental groups should thus not differ in these dimensions. However, while each firm in the “treatment”-group owns a subsidiary (or is owned by a shareholder) in a specific country, firms in the control group are not affiliated with this country. More precisely, the values depicted are conditional means: they stem from MNEs of comparable size and similar industry composition but different ownership structures. Red circles indicate significant deviations between the two groups in a given year.

---

36 We do, however, account for the characteristic error structure implied by equation 1 (i.e. the firm specific error component \( \mu(i) \)) and estimate the model via feasible GLS (random effects).

37 The vector includes a set of industry indicators, the logarithm of firm-specific assets to control for the impact of size, the number of affiliated companies to control for group spill-overs and a full set of time-specific effects to account for macroeconomic shocks.

38 The graphs do however not capture the influence of other variables, such as the impact of high debt levels on firm profitability.
Figure 12 and 13: Performance and leverage ratios and the link to MNEs in partner countries
Notes: Graph depicts average of firm-specific variables (Return on Assets and Leverage Ratio) for MNEs with an ownership link to a specific country (dark blue line) and the average of these variables for matched MNEs without this link.

Data Source: ORBIS (2016)

Noteworthy observations from Figures 12 and 13 include considerably lower reported profitability ratios of MNEs with Cypriote affiliates than in the control group. In 2009 and 2010, the difference with comparable firms is particularly remarkable and statistically significant. The development of the leverage ratio is presented in the second row and shows a moderate convergence between treatment and control group, as depicted in the third row.

Another interesting observation is that MNEs with an affiliate in Russia show no statistically significant differences in the return on assets in any given year. On average, however, profitability figures seem to be slightly higher than the returns of comparable firms, particularly before 2010. The second row indicates that MNEs with a Russian affiliate are moderately leveraged. The first column in Figure 12 contrasts MNEs with affiliates in the British Virgin Islands with a matched control group. While profitability ratios seem to be particularly low, there are no significant deviations in any year.

To further analyze whether group structures impact firm-specific variables, we estimate a series of regression specifications (see Tables 6a and b) where we include locational dummies in addition to controlling for industry composition and size. Aggregating over years supports the trends apparent in Figures 12 and 13: groups with affiliates in Cyprus exhibit significantly lower profitability ratios. On average, we find the return on assets to be 0.82 lower than the one of comparable firms without Cypriot affiliates. The difference is significant at the one percent level. The regression results also indicate that MNEs with affiliates in the UK (-0.44) and the British Virgin Islands (-1.42) exhibit significantly lower profitability ratios.

In contrast, we find MNEs with links to Poland, Germany, and the Netherlands to be more profitable than comparable firms of similar size with significantly positive deviations of 0.83, 0.69, and 0.86, respectively. These findings seem to be partly driven by leverage ratios. Groups with affiliates in Cyprus and Luxembourg are also highly leveraged while groups with direct relationships to Russia and Poland exhibit a lower ratio of liabilities to assets.
Table 6a: Profitability across partner countries

Random effects estimation
Dependent variable: return on assets
Explanatory variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>CY</th>
<th>RU</th>
<th>NL</th>
<th>GB</th>
<th>DE</th>
<th>VG</th>
<th>US</th>
<th>PL</th>
<th>AT</th>
<th>LU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-1.506***</td>
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<td>-1.535***</td>
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<td>(0.375)</td>
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<td>log(tangible assets)</td>
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<td>0.348***</td>
<td>0.345***</td>
<td>0.343***</td>
<td>0.348***</td>
<td>0.344***</td>
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<td>-0.003***</td>
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<td>-0.003***</td>
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<td>(0.001)</td>
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### Table 6b: Leverage across partner countries

Random effects estimation

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<th></th>
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<tr>
<td>Log(tangible assets)</td>
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<tr>
<td>Size of corporate group</td>
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<td>Log(employees)</td>
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Dependent variable: leverage ratio

Explanatory variables

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Log(tangible assets)</th>
<th>Size of corporate group</th>
<th>Log(employees)</th>
<th>CY</th>
<th>RU</th>
<th>NL</th>
<th>GB</th>
<th>DE</th>
<th>VG</th>
<th>US</th>
<th>PL</th>
<th>AT</th>
<th>LU</th>
</tr>
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<tbody>
<tr>
<td>Obs</td>
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<td>40254</td>
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<td>40254</td>
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<td>40254</td>
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</tr>
<tr>
<td>R</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
</tr>
</tbody>
</table>
Table 7 presents our main results on the relationship between withholding tax rates and firm-specific variables. More specifically, we test whether withholding tax rates drive the variation in profitability and leverage across MNEs with different ownership structures, documented above.

Table 7: Impact of withholding on firm level variables

<table>
<thead>
<tr>
<th></th>
<th>Dependent variable</th>
<th>Return on assets</th>
<th>Leverage ratio</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>**Explanatory variables</td>
<td>**</td>
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<td></td>
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<tr>
<td>Withholding tax</td>
<td></td>
<td>0.05***</td>
<td>0.04*</td>
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<td></td>
<td></td>
<td>(0.02)</td>
<td>(0.02)</td>
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<tr>
<td>Log(tangible assets)</td>
<td></td>
<td>0.37 ***</td>
<td>0.39***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.07)</td>
<td>(0.07)</td>
</tr>
<tr>
<td>Log(employees)</td>
<td></td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.08)</td>
<td>(0.08)</td>
</tr>
<tr>
<td>Size of group</td>
<td></td>
<td>-0.00***</td>
<td>-0.00***</td>
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<tr>
<td></td>
<td></td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
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<td>Country-specific effects</td>
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<td>40254</td>
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<tr>
<td>Adj. R2</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
</tr>
</tbody>
</table>

The first column shows that withholding tax rates help explain reported profitability. Controlling for industry and year fixed effects, the amount of reported tangible assets, the number of employees, and MNEs’ group-size, we find that a one percentage point increase in withholding taxation increases reported profitability by 5 percentage points. The impact is statistically significant at the 1% level. When additionally controlling for the presence of an affiliate in one of the most important partner countries (Cyprus, UK, Germany, Netherlands, Russia, Austria, Poland, Luxembourg), using a set of dummy variables, the estimated impact decreases only slightly in magnitude and remains significant at the 10% level, as shown in column 2. The observed effect thus also seems to be relevant outside of the main partner countries.

In columns 3 and 4 we examine whether the observed correlation between withholding tax rates and firm profitability is driven by a change in leverage ratios. In line with our expectations, we find that higher withholding taxation decreases the leverage ratio significantly. More specifically, we find that a one percentage point increase in withholding taxation decreases the debt share by 19%.
Withholding tax rates thus seem to be a determinant of reported profitability levels and the leverage of Ukrainian entities. However, the regression results indicate that the location of affiliated companies explains some residual variance, implying that the documented variations in firm profitability is not driven by withholding taxation alone. Specifically, after controlling for firm size, industry, macro-shocks and withholding tax rates, we find that firms with an affiliate in either Cyprus or the British Virgin Islands are surprisingly unprofitable. The difference to comparable firms lies at 0.45 and 1.35, respectively, and is significant at the 10% and 1% level.\textsuperscript{39} Similarly, the high profitability of MNEs with an affiliate in the Netherlands is not fully captured by withholding taxation or firm size.\textsuperscript{40}

5. Conclusion

To investigate the effect of reduced withholding tax rates on revenue collection in Ukraine we combine administrative information on income flows and publically available firm level information. Our analysis of income flows suggests that there are important revenue losses linked to reduced withholding tax rates on dividend, interest and royalty payments. Combining information on historical variation in Ukrainian treaty provisions with administrative data we also find, however, that income flows to a specific country tend to decrease following an increase in the relevant withholding tax rate with the country. This effect reduces the simple mechanical revenue gain one can expect from renegotiating a withholding rate at a higher level. Furthermore, we investigate indirect costs of reduced withholding rates and find that reported profits of Ukrainian multinationals are sensitive to withholding taxation, indirectly adding to total revenue losses. This effect is partly driven by differences in the use of debt financing. Group structures seem to impact the reported profitability of Ukrainian MNE affiliates.

Our findings point towards the importance of developing a comprehensive treaty policy approach to guide any future negotiations and/or revisions. This is particularly relevant with respect to the small number of major investment hubs (Cyprus, Netherlands, Switzerland, Luxembourg) accounting for a large share of income flows from Ukraine. A treaty can be beneficial where its benefits outweigh revenue losses. Consequently, further analysis of benefits should be done for the Ukrainian DTT’s to see whether they measure up against the cost estimates in this paper. Notably, however, where investment activity is merely redirected via another country to take advantage of treaty benefits, but would have taken place irrespective of the treaty, revenue losses are not offset by any potential gains. The findings of this study suggest that further targeted enforcement may be needed to address such round-tripping arrangements. Moreover, the analysis of reported MNE earnings, suggests that the ownership structure and operations with affiliates in certain jurisdictions should receive increased attention in risk assessment and transfer pricing audit activities.

\textsuperscript{39} Effective final tax rates may explain some of the residual variance. However, we cannot reliably capture applicable tax rates given that jurisdiction may simply be used as a conduit.

\textsuperscript{40} For simplicity, the coefficient estimates on the locational dummies, reported in this paragraph, are not depicted in Table 2.
At a more general level, our findings may motivate and provide input into a wider policy research agenda focused on a better understanding of costs and benefits of double tax treaties, with a particular emphasis on economies with asymmetric investment and income flows.
Bibliography


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