

Working paper

# International Profit Shifting and Multinational Firms in Developing Countries

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## **Abstract**

This paper analyses tax induced profit shifting out of developing and developed countries through debt financing. We use data on worldwide affiliates of German multinational firms. Our analysis focuses on the use of intra company debt. We find that affiliates of multinational firms located in low tax countries provide loans to affiliates located in high tax countries. The financing structures of affiliates located in developing countries are more sensitive to tax incentives than the financing structures of affiliates located in high tax countries. Our results suggest that the marginal effect of a tax rate change on tax financing in developing countries is twice as high as in developed countries. When comparing multinational groups with and without tax haven affiliates, we find no significant differences in profit shifting behaviour.

**Keywords:** international profit shifting, tax havens, corporate taxation, developing countries

**JEL Classification** H32, O12, O17

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## 1. Introduction

Developing economies are well-known to face difficulties in raising tax revenues. While the tax-to-GDP ratios of industrialised countries are usually above 30%, developing economies often observe tax-to-GDP ratios of 15% or lower. This limits the capacity of the state to fulfil its core tasks, especially to provide public goods and services that reduce poverty and foster economic development. One major challenge of raising taxes in developing economies is that many, particularly small, domestic businesses are unregistered with the tax authorities and operate in the shadow economy. Since multinational firms typically operate within the official sector, the taxation of multinational corporate income is an important source of government revenues in developing countries.

Recent studies however suggest that multinational firms engage in tax planning activities to avoid taxation in high-tax economies by shifting income from high-tax to low-tax countries. While this happens in both developing and developed countries, there is a common perception that developing economies are especially prone to multinational profit shifting. This is because their tax authorities often lack the resources to implement effective anti tax avoidance policies.. Furthermore, income shifting from developing countries may be facilitated by a lack of anti-avoidance legislation, such as transfer price documentation requirements or thin-capitalization rules. Even if such rules exist, they are typically enforced rather weakly.

Existing empirical evidence supports the hypothesis that multinational firms engage in tax-motivated income shifting in industrialized economies. Documented channels of corporate income shifting include distortions of transfer prices, the group's debt-equity structure, and the location of valuable assets (e.g. Clausing 2003; Huizinga and Laeven 2008; Dischinger and Riedel 2010). However, most studies concentrate on OECD countries. As emphasised by Fuest and Riedel (2009), reliable studies on multinational income shifting from the developing world are largely lacking. The purpose of this study is to fill this gap by empirically examining income shifting from developing economies. Our empirical analysis is based upon a detailed data set on German multinational firms and their affiliates around the world, including affiliates in industrialised and developing countries. The data comprises unique information in particular on intra-company loans, that is loans which are provided by the parent firm and other affiliates within the multinational group, as opposed to loans from

third parties. Since intra company loans are particularly suited for profit shifting activities, these loans are in the focus of our analysis.

Multinational corporations have an incentive to arrange the group's debt-equity structure so that low-tax affiliates provide loans to subsidiaries in high-tax countries. The interest payments are deductible for the high-tax affiliate and add to the taxable profit of the low-tax subsidiaries. This strategy allows the multinational firms to shift taxable profits from high-tax to low-tax countries, so that the overall tax burden of the group declines. If multinational firms do use this type of profit shifting technique, one would expect the ratio of intra-firm loans to total assets of a multinational affiliate to be increasing in the corporate income tax rate of the host economy. Controlling for unobserved heterogeneity between the affiliates and various time-varying firm and country characteristics, we find evidence in line with this prediction. Further, we distinguish between the effects for affiliates located in industrialised economies and affiliates located in developing economies. Our results suggest that the intra-group debt ratio in developing economies reacts significantly more sensitively to changes in the corporate tax rate than in developed economies. The estimations indicate that the effect in developing economies is twice as high as that in developed economies.

In addition, to complement the analysis, we address the notion that affiliates located in tax havens play a significant role in the debt financing channel of income shifting especially in the developing world. In particular, profit shifting strategies may be easier to implement if the multinational group includes a tax haven affiliate that may absorb profits from other investment locations of the group. Thus, we assess whether intra-group loans of affiliates with a tax haven connection react more sensitively to taxation in developing economies than those in developed economies. This hypothesis is not confirmed in the data. This may indicate that the important factor for international debt shifting is the existence of an affiliate in a low tax country rather than other special "features" of tax havens. In line with this notion, we examine the reaction of the internal debt ratio to the tax differential within the group, which is defined as the difference between the host country tax and the lowest tax rate in the group. Our estimates suggest a significant effect which is again larger in the case of developing economies than in the case of developed economies.

A number of related studies address the sensitivity of the capital structure of multinational affiliates to the corporate income tax rate in the industrialized world. Examples of such studies are Jog and Tang, (2001), Mills and Newberry (2004), Huizinga et al. (2008), and Egger et al. (2009). Whereas most of the literature has focused on the total debt-to-asset ratio,

Altshuler and Grubert (2003), Desai et al. (2004), Mintz and Weichenrieder (2005) as well as Ramb and Weichenrieder (2005) report a significantly positive effect of the host-country tax rate on internal debt. Moreover, Buettner and Wamser (2009) show that a multinational subsidiary's (internal) debt ratio is not only determined by the host country corporate tax rate but rather by the corporate tax rate differential to other affiliates within the multinational group which strengthens the notion that responses to corporate tax rate changes are driven by intra-group profit shifting incentives. Nevertheless, none of the existing papers specifically assesses profit shifting from developing economies.<sup>1</sup>

The rest of the paper is structured as follows. Section 2 presents a short theoretical motivation for the analysis. Section 3 describes the data and provides a number of empirical regularities on multinational firms in developing countries in our sample. Sections 4 and 5 present the empirical identification strategy and the results, respectively. Section 5 concludes.

## 2. Theoretical Motivation

Consider a representative multinational firm that owns one affiliate in country  $c$  and one affiliate in country  $h$ . The corporate income tax rates are denoted by  $t_c$  and  $t_h$ . Without loss of generality, we assume country  $c$  to be the high-tax country:  $t_c > t_h$ .

The affiliates earn an exogenous pre-tax profit  $\pi_c$  and  $\pi_h$ . The variables  $\pi_c$  and  $\pi_h$  are interpreted as the taxable profits that would have been declared in the absence of tax differentials between the two countries. This does not necessarily represent profits before intra company interest payments. It may well be and is indeed likely that firms use intra company loans for purposes unrelated to taxes. In our model, we assume that, beyond intra company debt motivated by other factors, the multinational firm can use additional debt in order to shift income to the low-tax country  $h$ . This additional debt gives rise to interest payments denoted by  $s$ . Anecdotal evidence and a growing number of empirical studies suggest that multinationals engage in profit shifting activities through several channels, for example through the distortion of intra-firm transfer prices, the distortion of debt-equity structures and the relocation of valuable assets. The parameter  $s$  may, in principle, be interpreted as reflecting profit shifting through any of these channels. In our empirical analysis, we will focus on intra-firm debt shifting, which implies that the low-tax affiliate

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<sup>1</sup> In the finance strand of literature, Booth et al. (2001) examine whether the pecking-order hypothesis applies to domestic firms in developing economies.

provides loans to the high-tax firm and receives the associated interest payment (which is deductible from the corporate tax base in the high-tax country) as income. Focussing on debt shifting activities, the amount of shifted profit corresponds to  $s = r \cdot l$ , where  $r$  depicts the interest rate and  $l$  denotes the volume of the loan provided by the low-tax affiliate.

While profit shifting activities reduce the overall tax burden, the firm has to bear the costs associated with these activities. Essentially, these costs arise due to three reasons. Firstly, changing the financing structures within the multinational firm may force firms to deviate from financing structures which are optimal from a management perspective. Secondly, profit shifting usually requires investment in tax and accounting services. Thirdly, tax authorities take measures against profit shifting because they have an interest to protect their tax base. In many countries, the scope for profit shifting through debt is restricted by so called thin capitalization rules, which imply that interest payments on debt provided by other group affiliates may not be deductible from the corporate tax base. Moreover, tax incentives to shift income to low tax countries are limited if so called controlled foreign company (CFC) rules apply. According to these rules, interest income received by low-tax subsidiaries in a multinational group is taxable in the country where the parent company resides. Similar restrictions apply for other profit shifting channels. In our model, we include these costs in a rather stylised manner. We follow the existing literature (see e.g., Haufler and Schjelderup, 2000) by assuming that multinational firms face convex profit shifting costs  $c(s)$ , with  $c'(s) > 0$  and  $c''(s) > 0$ . This implies that the costs of profit shifting are convex in the amount of the shifted income.

Moreover, it is important for our analysis to note that profit shifting costs are unlikely to be the same across countries, in particular when comparing developing and developed countries. For instance, the audit capacity of tax authorities in developing countries is widely considered to be weaker than in industrialized economies. In addition, developing countries in general tend to have lax and less sophisticated anti tax avoidance legislations. The combination of lax rules and inferior enforcement capacity would imply that profit shifting costs are lower for affiliates in developing economies compared to affiliates in the industrialized world. Formally, we consider this aspect by assuming that the overall cost of international profit shifting is given by the cost function  $C = \gamma_g \cdot c(s)$ , with  $g \in \{i, d\}$ , where the subscript  $i$  ( $d$ ) indicates industrialized (developing) economies. Profit shifting costs in developing countries are higher if  $\gamma_i > \gamma_d$ . The multinational firm's after tax profit reads:

$$\pi = (1 - t_c)(\pi_c - s) + (1 - t_h)(\pi_h + s) - \gamma_g c(s), g \in \{i, d\}. \quad (1)$$

The multinational firm maximizes its after-tax profit in equation (1) by choosing the amount of profit shifting  $s$ . The first order condition reads

$$t_c - t_h = \gamma_g c'(s), \quad g \in \{i, d\} \quad (2)$$

and thus equates the marginal gains from profit shifting and the marginal costs from profit shifting. As the marginal costs from profit shifting are higher in industrialized countries ( $\gamma_i > \gamma_d$ ), it follows directly that, ceteris paribus (for a given tax rate differential), the amount of profit shifting is higher if country  $c$  is a developing economy. Differentiating (2) also shows that

$$\frac{ds}{d(t_c - t_h)} = \frac{1}{\gamma_g c''(s)} \quad (3)$$

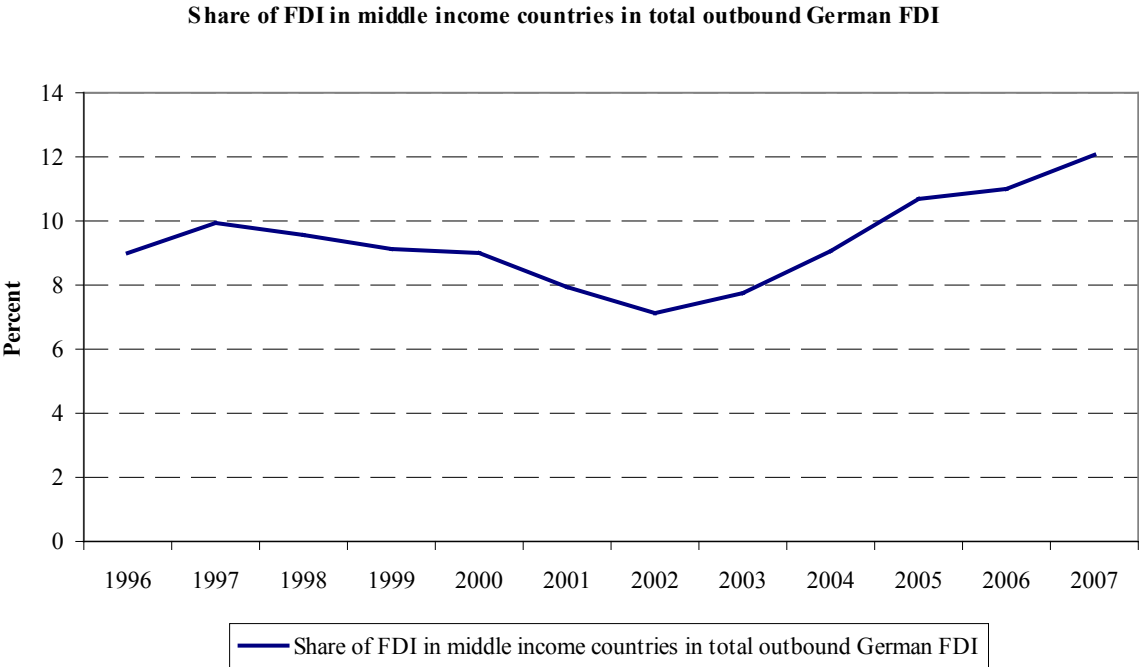
As  $\gamma_i > \gamma_d$ , equation (3) thus suggests that the effect of a change in the tax rate differential on the amount of profit shifted is larger for affiliates located in the developing world than for comparable affiliates in the industrialized world. Note that this higher sensitivity of profit shifting with respect to tax rate differentials goes both ways. In this setup, the erosion in the tax base resulting from an increase in the tax rate is predicted to be higher in the case of a developing country than in the case of a developed country. Put it differently, developing economies can enlarge their tax bases by cutting the corporate tax rates. In the following, we will bring this hypothesis to the data and test whether multinationals engage in more debt shifting in developing countries.

### 3. Data and Empirical Regularities

The study uses the German outbound FDI firm-level (MIDI) data provided by the Deutsche Bundesbank. The major benefit of the MIDI data is that we have detailed information on internal debt of foreign subsidiaries of German parent firms. Furthermore, the data includes all German FDI affiliates (private and publicly traded firms) that satisfy the reporting requirements of the foreign trade and payments regulation. The data spans from 1996 to 2007 and includes about 14,000 affiliates per year operating in 53 countries. We consider a country to be a developing economy if it is classified as middle income country based on the classification of the World Bank (we do not observe information on low income countries). Our final panel data contains about 27,750 affiliates operating in 22 developing economies.

A descriptive analysis of the data shows a number of interesting general patterns and trends. Firstly, FDI to developing countries is increasing over time. Figure (1) depicts the share of aggregate German FDI in developing economies relative to total outbound German FDI. This share has increased from about 9 percent in 1996 to 12 percent in 2007. In absolute terms, the aggregate outbound FDI to developing countries as identified in our sample amounts to 99,400 million Euros in 2007.<sup>2</sup> This may reflect the increasing importance of emerging countries in the world economy.

**Figure 1**  
**The Share of FDI in Developing Countries**



Secondly, the productivity of multinational affiliates appears to be lower in developing countries than in developed countries. Table (1) displays country averages for two different profitability measures: 1) the average firm-level revenues per employee, typically referred to as labour revenue productivity 2) the average firm-level after-tax profits per employee, which

<sup>2</sup> This is based on the Deutsche Bundesbank definition of FDI. For detailed information on this method, the reader is referred to Lipponer (2008).



we call labour profit ratio. Table (1) also includes information on the average firm-level ratio of internal loans to total assets, the variable of key interest in this paper.

In line with previous studies (see e.g. Bloom et al. (2010)), table (1) shows that the labour revenue productivity of multinational affiliates decreases in the GDP per capita of the host economy. The labour profit ratio is also substantially lower in the case of developing economies, as the second column in table (1) shows.

Bloom et al. (2010) suggest that this pattern may reflect potential financial constraints facing firms in developing economies. While this could explain the low productivity of domestic firms which are relying on external debt, the reported descriptive statistics do not suggest that this is the case for multinational affiliates. The average ratio of internal loans to assets does not exhibit a very clear and systematic negative relation to income levels, as the last column in table (1) shows.

**Table 1**  
**Average Labour Revenue Productivity, Average Labour Profit Ratio, and Average Ratio of Internal Loans to Assets in different country groups**

	Average Labour Revenue Productivity	Average Labour Profit Ratio	Average Ratio of Internal Loans to Assets
Lower middle countries	349.4	6.41	0.202
Upper middle income countries	354	12.87	0.269
High income countries	1105.15	153.47	0.305

How does the presence of multinational firms in tax havens affect reported profits and financing structures? If tax haven presence implies more income shifting activity, one might expect affiliates of multinational firms with other affiliates in tax haven countries to report lower profits or higher internal loan ratios. Of course, one should take into account that tax haven presence is itself a choice, and it is likely to be associated systematically with other firm attributes. We will come back to this issue in the next sections. Figure (2) provides information on the role of tax haven presence of multinational firms.

An affiliate is considered to have a connection to a tax haven if at least one member in its group is located in a tax haven country. A country is considered to be a tax haven following the OECD definition (OECD; 2009). In particular, tax haven countries are those jurisdictions

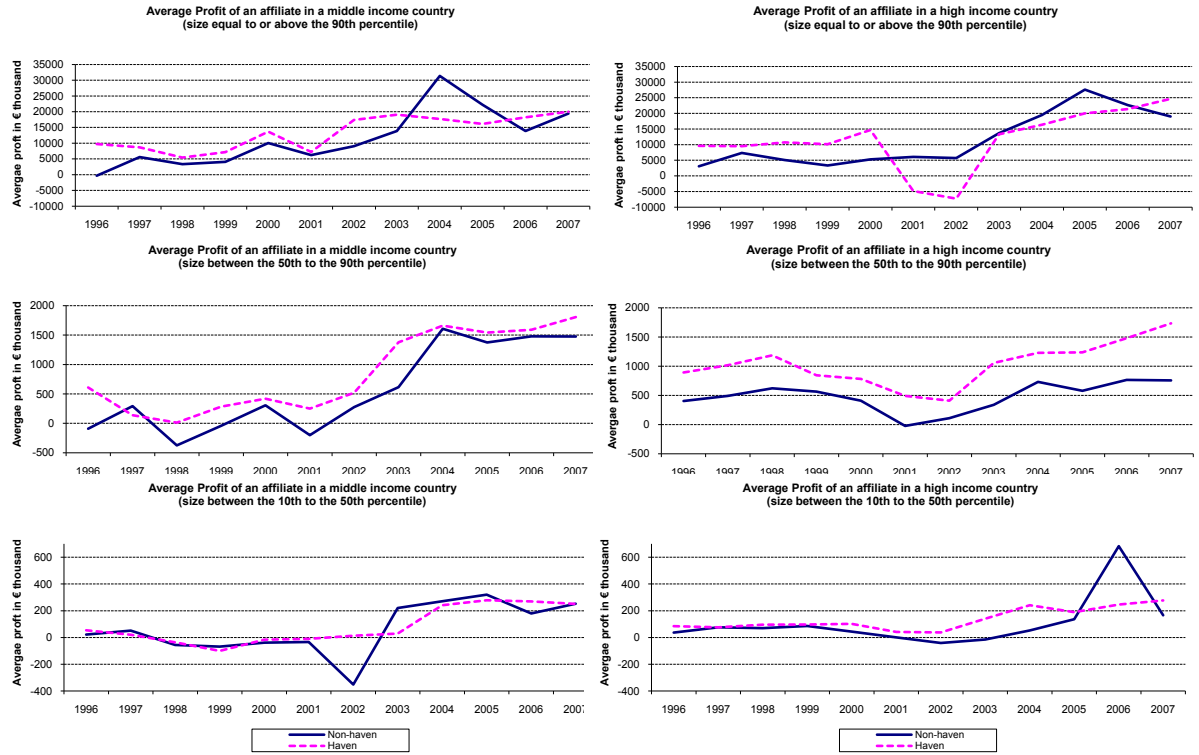
that have not committed to the internationally agreed tax standard or committed but have not yet substantially implemented. The appendix shows a list of these countries.

Overall, affiliates that have connections to tax havens do not appear to systemically report lower or higher profits than their counterparts that do not have connections to tax havens. At the firm level, the panels of figure (2) show average profits of affiliates with or without tax haven connections operating in middle or high income countries. The plots in figure (2) distinguish between averages based upon the sizes of the affiliates: The 10<sup>th</sup>, 50<sup>th</sup> and the 90<sup>th</sup> percentile. These average profits do not show considerable differences across haven and non-haven groups. The only exception where profits seem to be systemically different between the two groups of affiliates is within the size range from the 10<sup>th</sup> to the 50<sup>th</sup> percentile. Within this range, affiliates with connection to tax havens report higher profit, but in both developing and developed economies.

Moreover, figure (3) presents the affiliate's average loans granted from the group. It indicates that large affiliates with connections to tax havens exhibit a higher internal loan-to-assets ratio than their counterparts that do not have tax haven affiliates. In turn, the debt ratios of small affiliates with and without tax haven connection hardly differ. This pattern emerges in both, developing and industrialized countries. Figure (4) plots the average loans granted from the related parties *in Germany* to an affiliate aboard. Overall, the picture is similar to that reported in figure (3).

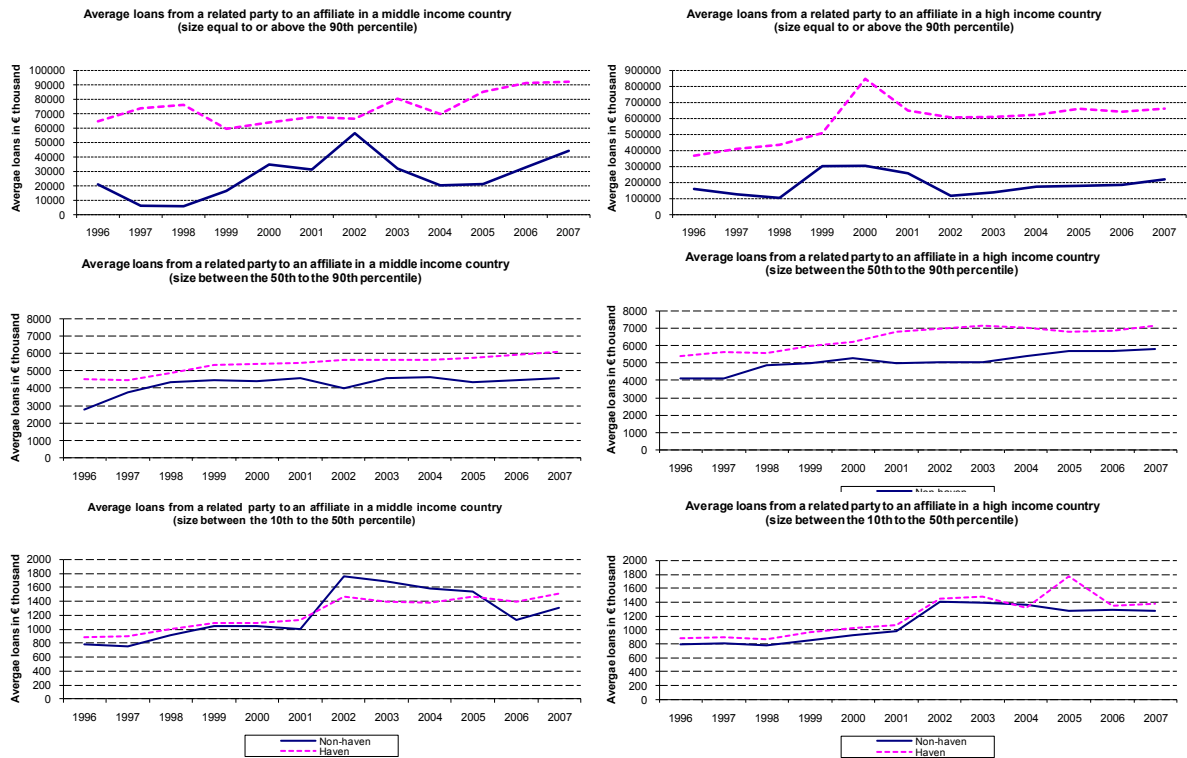
**Figure 2**

**Average Profits**



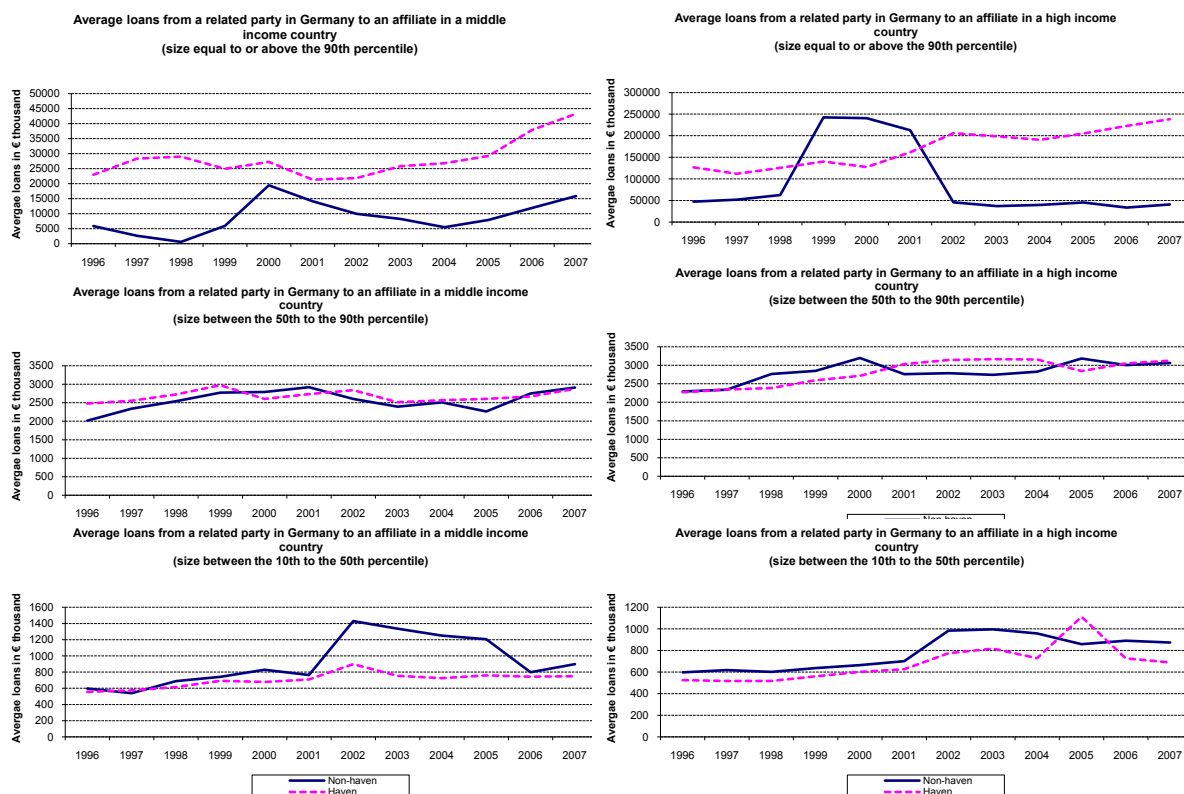
**Figure 3**

**Average Internal Loan Ratio**



**Figure 4**

**Average Loan Ratio from Related Parties in Germany**



In our regression analysis, we study both above mentioned leverage ratios, and relate them to the statutory corporate income tax rate of the host economy. Table (2) summarises averages, standard deviations and medians of our three key variables. On average differences in internal loan ratios between developing and developed countries are small. The average statutory corporate income tax rates are also similar.

**Table 2**  
*Descriptive Statistics*

	<i>Developing</i>			<i>Developed</i>		
	<i>Mean</i>	<i>S.d.</i>	<i>Median</i>	<i>Mean</i>	<i>S.d.</i>	<i>Median</i>
(loans from related party) / (total assets)	0.243	0.25	0.149	0.234	0.13	0.12
Log of (loans from related party in Germany) / (total assets)	0.149	0.22	0.03	0.129	0.12	0.01
Statutory corporate income tax rate	0.30	0.06	0.33	0.32	0.06	0.34

#### 4. Empirical Specification

Our discussion in Section 2 suggests that the debt structure of affiliates in developing economies reacts more sensitively to taxation than that of affiliates located in developed economies. To empirically test this prediction, we estimate an empirical specification of the following form:

$$debt_{k,n,t} = \gamma_0 + \gamma_1 tax_{n,t} + \gamma_2 (tax_{n,t} \times dev_n) + \Gamma \mathbf{x}_{k,n,t} + \Phi_k + \theta_t + \varepsilon_{k,t} \quad (4)$$

where the subscript  $k$  denotes each multinational subsidiary, subscript  $n$  denotes each country, and  $t$  is a subscript for each year. Concerning the dependent variable  $debt$ , we examine two different ratios of intra-company loans: 1) The ratio of debt from parent companies and related parties to total assets, and 2) the ratio of debt from parent companies and related parties in Germany to total assets. The explanatory variable of central interest is the statutory corporate income tax rate ( $tax$ ). As shown in Section 2, the incentive to shifting income out of a host country is higher, the higher the host country's statutory corporate tax rate. For internal debt shifting activities, this implies that multinational subsidiaries rely more heavily on debt financing, especially through intra-company loans provided by affiliated firms within the multinational group, when the tax rate increases. Thus we expect  $\gamma_1$  to be positive.

As discussed in Section 2, developing countries may be more prone to profit shifting activities than industrialised economies because the latter are likely to have more effective anti-tax avoidance legislation and enforcement. To assess this hypothesis, we define a dummy variable that is equal to 1 if the firm is located in a middle income country ( $dev$ ). Further, we include in the regression the interaction term  $tax_{n,t} \times dev_n$ . If debt financing behaviour of affiliates located in developing economies is more sensitive to the tax rate in comparison to the reference group (high income economies), we expect the coefficient estimate  $\gamma_2$  to be positive. The vector  $\mathbf{x}$  contains time-varying control variables, including the host country's GDP per capita (to capture the country's level of development), the ratio of domestic credits to the private sector over GDP, the Transparency International corruption perception index (CPI) and the real interest rate. Also, we include a full set of firm fixed effects to control for time-constant unobserved heterogeneity between the affiliates and a full set of year fixed effects  $\Phi_k$  to control for common shocks to all subsidiaries in our sample over time.

However, the profit shifting decision is plausibly not only determined by the affiliate's host country tax but also depends on the structure of other affiliates in the group. Precisely, profit

shifting strategies may be especially attractive if the multinational group owns tax haven affiliates which may absorb the shifted profit. To test this, we rerun the empirical specification in equation (4) for two sub-samples: 1) A sample of affiliates with at least one member in the group that is located in a tax haven (connection with tax havens), and 2) a sample of affiliates with no member of the group that is located in a tax haven (no connection to tax havens).<sup>3</sup>

## 5. Results

Table (3) reports the estimation results obtained from the benchmark model. The observational unit is the multinational subsidiary per year. Standard errors are robust and account for clustering at the country year-level. These are reported in parentheses below the coefficient estimates. The dependent variable is the ratio of loans from related parties to total assets. In columns (1) to (4) we carry out the analysis on the sample of developing economies. The analysis includes affiliate fixed effects and year fixed effects. In column (1) we present our benchmark estimation, column (2) adds a number of controls. As expected the estimated coefficient on the tax rate ( $\gamma_t$ ) is positive suggesting that a 10 percentage point increase in the host country's tax rate increases this loan-ratio by 2.75 percentage points (column 2). Since we cannot include country fixed effects simultaneously with affiliate fixed effects, in column (3), we change the identification strategy, and test what happens if we include country fixed effects. The results are robust in terms of signs and significance of the estimated coefficients. As a further robustness check, we include in column (4) only those affiliates that are directly owned by the parent firm in Germany. There is no evidence that the results change.

In columns (5) to (8) we rerun the analysis in columns (1) to (4) but use the sample of affiliates in developed economies. The results show that in all specifications the estimated coefficient on the tax rate is smaller than that in the case of developing economies. Additionally, in column (1) of table (4), we estimate a similar specification which comprises the entire sample and includes an interaction term between the tax variable and the developing country indicator. In line with the previous results, the coefficient estimate on both, the tax variable and the interaction term turn out to be positive and statistically significant. This result is robust against restricting the sample to directly owned affiliates in column (2) and against adding country instead of affiliate fixed effects in column (3). Furthermore, specifications (5) to (8) re-estimate the previous baseline regressions using the ratio of loans from related

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<sup>3</sup>There are potential endogeneity concerns regarding the tax haven variable. We will discuss this issue below.

parties in Germany to total assets which derives very similar results. Thus, the specifications presented in tables (3) and (4) support the hypothesis of Section 2 which suggests that debt shifting is more of an issue in developing countries.

Is the presence of multinational firms in tax havens associated with a higher reliance on debt shifting? To assess this question, we define an interaction term between the corporate tax rate and a dummy indicating those affiliates in the sample which belong to multinational groups with a connection to tax haven. We add this interaction variable to our baseline specifications presented previously and re-estimate the model. These results are presented in table (5). We do not find support to the notion that affiliates with connections to tax havens rely more on debt shifting than affiliates that do not have connections to tax havens. This might indicate that the important factor for international debt shifting is the existence of an affiliate in a low tax country rather than special “features” of tax havens. This view can be supported by referring to column (4) of table (4). The reaction of the internal debt ratio to the tax differential within the group (that is the difference between the affiliate’s host country tax and the lowest tax rate of an affiliate within the group) is significant and also shows more sensitivity in the case of developing economies than in the case of developed economies.

We end this section with one caveat. The tax haven dummy is a choice variable of the multinational group. In particular, one could argue that firms with more aggressive tax planning will be more likely to set up affiliates in tax havens. Then, the implications of this argument have to be reflected in the data. For instance, the parent firm establishes an affiliate in a tax haven to facilitate debt shifting. Consequently, the debt ratios of the other affiliates within the group will be expected to increase. This is what we attempted to test. Concerns regarding endogeneity of the haven dummy arise if high dependency on debt shifting increases the probability of establishing an affiliate in a tax haven. However, two points can be noted with this regard. First, this reinforces the sign (qualitative effect) and the magnitude (quantitative effect) of our estimated coefficient. However, even with this (rather “supporting”) potential endogeneity concern, our estimates are insignificant. This result may indicate that international debt shifting appears to be due international differences in tax rates and seems not to require special “features” of tax havens. Second, the presence of a firm in a tax haven is in principle a discrete decision that could be revised only once in a while (and more likely to be taken by different people than those who decide over the loan policy of the affiliate). For example, if the multinational group has a connection to tax havens for many years (even before sample starts), then from the perspective of an affiliate and its choice over its debt-ratio, the tax haven connection can be considered “exogenous”. Simply they can

apply for loans from this already existing haven-affiliate. If this is not what we find in the data, one interpretation might be that special features of tax havens are associated with different international tax plans, and not necessarily with debt shifting. Admittedly, endogeneity is always a concern. However, our discussion in this paragraph opens further questions for future research.

**Table 3**  
**Empirical Results: Developing versus Developed Economies**

Dependent Variable:	Ratio of Loans from Related Parties to Total Assets							
	Developing Countries				Developed Countries			
	(1)	(2)	(3)	(4) <sup>†</sup>	(5)	(6)	(7)	(8) <sup>†</sup>
Tax rate	0.290 <sup>a</sup> (.069)	0.275 <sup>a</sup> (.068)	0.365 <sup>a</sup> (.067)	0.26 <sup>a</sup> (.066)	0.165 <sup>a</sup> (.040)	0.110 <sup>a</sup> (.040)	0.158 <sup>a</sup> (.045)	0.145 <sup>a</sup> (.043)
GDP per capita		-0.045 <sup>a</sup> (.011)	-0.010 (.010)	-0.051 <sup>a</sup> (.010)		-0.067 <sup>a</sup> (.012)	-0.083 <sup>a</sup> (.012)	-0.086 <sup>a</sup> (.012)
Domestic credits / gdp		0.020 (.013)	0.016 (.013)	0.032 <sup>b</sup> (.015)		0.022 <sup>a</sup> (.007)	0.017 <sup>b</sup> (.007)	0.022 <sup>a</sup> (.007)
Real interest rate		0.013 (.026)	0.029 (.029)	0.009 (.025)		-0.008 (.043)	-0.021 (.058)	-0.030 (.051)
CPI		0.071 <sup>a</sup> (.026)	0.112 <sup>a</sup> (.024)	0.111 <sup>a</sup> (.024)		0.028 (.036)	0.100 <sup>a</sup> (.036)	0.064 <sup>c</sup> (.035)
Log sales		0.004 <sup>a</sup> (.001)	0.004 <sup>a</sup> (.000)	0.003 <sup>a</sup> (.001)		0.003 <sup>a</sup> (.000)	0.002 <sup>a</sup> (.000)	0.002 <sup>a</sup> (.000)
Affiliate fixed effects	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	No	No	Yes	No	No	No	Yes	No
No. of observations	27,762	27,762	27,762	20,964	142,749	142,749	142,749	95,352
Adjusted R <sup>2</sup>	0.61	0.61	0.02	0.61	0.66	0.66	0.02	0.66

Notes: <sup>a</sup>, <sup>b</sup> and <sup>c</sup> indicate significance at the level of 1, 5 and 10% respectively. Standard errors reported in parentheses are robust corrected for clustering at the country-year level. Regressions with the symbol <sup>†</sup> include only affiliates that are directly owned by the German parent.



**Table 4****Empirical Results: Robustness**

Dependent Variable:	Ratio of Loans from Related Parties to Total Assets				Ratio of Loans from Related Parties in Germany to Total Assets			
	Full Sample				Developing Countries	Developed Countries	Full Sample	
	(1)	(2) <sup>†</sup>	(3)	(4)	(5)	(6)	(7)	(8) <sup>†</sup>
Tax rate	0.094 <sup>b</sup> (.043)	0.113 <sup>b</sup> (.048)	0.168 <sup>a</sup> (.052)	0.26 <sup>a</sup> (.066)	0.248 <sup>a</sup> (.060)	0.077 <sup>b</sup> (.031)	0.072 <sup>b</sup> (.035)	0.093 <sup>b</sup> (.042)
Tax × dev	0.216 <sup>b</sup> (.093)	0.212 <sup>b</sup> (.100)	0.171 <sup>c</sup> (.095)				0.201 <sup>b</sup> (.082)	0.189 <sup>b</sup> (.090)
Tax difference				0.041 <sup>a</sup> (.011)				
Tax difference × dev				0.075 <sup>b</sup> (.032)				
GDP per capita	-0.048 <sup>a</sup> (.007)	-0.059 <sup>a</sup> (.008)	-0.044 <sup>a</sup> (.008)	-0.053 <sup>a</sup> (.008)	-0.036 <sup>a</sup> (.008)	-0.064 <sup>a</sup> (.011)	-0.041 <sup>a</sup> (.006)	-0.056 <sup>a</sup> (.008)
Domestic credits / gdp	0.024 <sup>a</sup> (.006)	0.027 <sup>a</sup> (.007)	0.018 <sup>a</sup> (.006)	0.027 <sup>a</sup> (.006)	0.005 (.011)	0.013 <sup>b</sup> (.005)	0.014 <sup>a</sup> (.005)	0.019 <sup>a</sup> (.006)
Real interest rate	0.027 (.020)	0.031 (.022)	0.044 <sup>c</sup> (.024)	0.033 (.022)	-0.016 (.020)	0.005 (.039)	0.006 (.017)	0.014 (.021)
CPI	0.010 (.019)	0.032 (.019)	0.067 <sup>a</sup> (.019)	-0.006 (.021)	0.041 <sup>c</sup> (.021)	0.033 (.030)	0.002 (.016)	0.007 (.018)
Log sales	0.003 <sup>a</sup> (.000)	0.002 <sup>a</sup> (.000)	0.002 <sup>a</sup> (.000)	0.003 <sup>a</sup> (.000)	0.002 <sup>a</sup> (.000)	0.001 <sup>a</sup> (.000)	0.001 <sup>a</sup> (.000)	0.002 <sup>a</sup> (.000)
Affiliate fixed effects	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	No	No	Yes	No	No	No	No	No
No. of observ.	170,511	116,316	170,511	170,511	27,762	142,749	170,511	116,316
Adjusted R <sup>2</sup>	0.65	0.65	0.02	0.65	0.61	0.66	0.65	0.65

Notes: <sup>a</sup>, <sup>b</sup> and <sup>c</sup> indicate significance at the level of 1, 5 and 10% respectively. Standard errors reported in parentheses are robust corrected for clustering at the country-year level. The variable dev is a dummy that is equal to 1 if the firm is located in a middle income country as described in section 2, and zero otherwise. Regressions with the symbol <sup>†</sup> include only affiliates that are directly owned by the German parent.

**Table 5****Empirical Results: Tax Havens and Debt Shifting**

Dependent Variable:	Ratio of Loans from Related Parties to Total Assets			
	Developing Countries		Developed Countries	
	(1)	(2)	(3)	(4)
Tax rate	0.271 <sup>a</sup> (.069)	0.275 <sup>a</sup> (.068)	0.101 <sup>b</sup> (.041)	0.107 <sup>a</sup> (.040)
Tax rate × haven1_firm	0.007 (.017)		0.011 (.007)	
Tax rate × haven2_firm		0.006 (.018)		0.025 <sup>b</sup> (.010)
GDP per capita	-0.045 <sup>a</sup> (.011)	-0.045 <sup>a</sup> (.011)	-0.067 <sup>a</sup> (.013)	-0.067 <sup>a</sup> (.013)
Domestic credits / gdp	0.020 (.013)	0.020 (.013)	0.022 <sup>a</sup> (.007)	0.022 <sup>a</sup> (.007)
Real interest rate	0.013 (.026)	0.013 (.026)	-0.009 (.043)	-0.008 (.043)
CPI	0.071 <sup>a</sup> (.026)	0.071 <sup>a</sup> (.026)	0.029 <sup>a</sup> (.036)	0.028 <sup>a</sup> (.036)
Log sales	0.004 <sup>a</sup> (.001)	0.004 <sup>a</sup> (.001)	0.003 <sup>a</sup> (.000)	0.003 <sup>a</sup> (.001)
Affiliate fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of observations	27,762	27,762	142,749	142,749
Adjusted $R^2$	0.61	0.61	0.66	0.66

Notes: <sup>a</sup>, <sup>b</sup> and <sup>c</sup> indicate significance at the level of 1, 5 and 10% respectively. Standard errors reported in parentheses are robust corrected for clustering at the country-year level.

**6. Conclusions**

This paper empirically assesses multinational profit shifting from developing countries. Precisely, we investigate the debt shifting channel and determine to what extent multinational firms shield their profits generated in high-tax affiliates through high levels of internal debt.

For this purpose, we use a rich data set provided by the Deutsche Bundesbank which includes information on all directly held foreign subsidiaries of German corporations. In line with previous research, we find evidence for debt shifting behaviour.

Distinguishing between affiliates in industrialised and developing countries, our results show that debt shifting activities are especially pronounced in the latter. Quantitatively, the ratio of internal debt to total assets reacts more than two times as sensitively to changes in the host country tax for affiliates in developing economies compared to affiliates in the industrialized world. The results can thus be interpreted as evidence in line with the notion that developing economies are more vulnerable to multinational profit shifting strategies than their industrialized counterparts.

It is important to note that larger profit shifting activities from the developing world do not necessarily imply welfare losses for the respective host countries. A number of recent papers argue that enhanced profit shifting opportunities may be an efficient strategy to attract highly mobile firms to high-tax countries (Hong and Smart (2010)). Of course, this view is highly controversial (Slemrod and Wilson (2009)). Assessing the welfare implications of profit shifting activities from developing countries is hence an important area for future research.

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