Online-Appendix zu

„The impact of tax differentials on pre-tax income of Swiss MNEs“

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A Appendix Section 2

Table 15 shows a structured overview on the studies included in the literature review in Section 2 .

Table 15 Literature categorization

Identifier	Dependent	Tax variable	Driver / Legislation	Data / Method	Region / Period
Hines and Rice (1994)	EBIT	Effective tax rate	None	Country-level cross-section, OLS	US, 1982
Huizinga and Laeven (2008)	EBIT	Composite tax variable	Scale of operation	Affiliate-level cross-section, OLS	Europe, 1999
Beer and Loeprick (2015)	EBIT	Tax differential	Intangibles of subsidiary, size of MNE	Affiliate-level panel data, FE	Europe, 2003-11
Conover and Nichols (2000)	US taxes	N/A, other methodology	Firm size	Group-level panel data, FE	US, 1982-84, 1988-90
Grubert (2003)	ROS	Statutory tax rate	Intangibles of parent	Affiliate-level cross-section OLS	US, 1996
Dischinger and Riedel (2011)	P/L before tax	Average tax differential	Intangibles of subsidiary	Affiliate-level panel data, FE	Europe, 1995-2005
Dischinger and Riedel (2008)	Intangibles	Average tax differential	N/A, other methodology	Affiliate-level panel data, FE	Europe, 1993-2006
Karkinsky and Riedel (2013)	Number of patent applications	Statutory tax rate	N/A, other methodology	Affiliate-level panel data, FE	Europe, 1995-2003
Weichenrieder (2009)	ROA	Statutory tax rate	Ownership share	Affiliate-level panel data, FE	Germany, 1996-2003
Desai, Foley, and Hines (2004)	ROA	Statutory tax rate	Ownership share	Affiliate-level panel data, FE	US, 1982-1997
Dischinger (2008)	P/L before tax	Tax differential	Ownership share	Affiliate-level cross-section, OLS[a]	Europe, 2004[a]
Buettner and Wamser (2103)	Internal loans	Statutory tax rate	Ownership share	Affiliate-level panel data, FE	Germany, 1996-2005
Dischinger, Knoll, and Riedel (2014)	P/L before tax	Tax differential	Shifting direction	Affiliate-level panel data, FE	Europe, 1995-2007
Lohse and Riedel (2012)	EBIT	Statutory tax rate	TP legislation	Affiliate-level panel data, FE	Europe, 1999-2009
Buettner, Overesch, and Wamser (2017)	PPE	Statutory tax rate	Thin-capitalization rules	Affiliate-level panel data, FE	Germany, 1996-2007
Beuselinck, Deloof, and Vanstraelen (2015)	ROS	Tax differential	Tax enforcement	Affiliate-level panel data, FE	Europe, 1998-2009
Ruf and Weichenrieder (2012)	Passive assets	Statutory tax rate	CFC rules	Affiliate-level panel data, FE	Germany, 1996-2006

Notes. The classification is based on the main analysis in these papers. Other specifications might be used in robustness checks or alternative analysis. N/A refers to "not ap - plicable". [a]Dischinger (2008) uses panel data and FE estimation to analyze income shifting. To examine the effect of the ownership share however, he uses only the last year of his panel, as ownership information from ORBIS is available for the last year only. ROA, ROS, and PPE stand for return on assets, return on sales and plant, property and equipment. Source: own table.

B Appendix Section 4

B.1 Matrix algebra and industry classification

The vector $\boldsymbol{T}_{it}$ of dimensionality (1x8) contains the values of the categorical variables T_t for subsidiary i in year t. The categorical variables T_t are equal to 1 if the observation falls into year t, and 0 otherwise. The variable for the year 2007 is omitted to avoid perfect multicollinearity. Therefore, each vector $\boldsymbol{T}_{it}$ contains exactly one value equal to 1 and seven values equal to 0. The vector $\boldsymbol{\theta}_{it}$ of dimensionality (8x1) contains the coefficients for the categorical variables T_t. The vectors are given below. The vector $\boldsymbol{\theta}_{it}$ has been transposed.

$$\begin{aligned} \boldsymbol{T}_{it} &= (T_{08} \quad T_{09} \quad T_{10} \quad T_{11} \quad T_{12} \quad T_{13} \quad T_{14} \quad T_{15}), \\ \boldsymbol{\theta}'_{it} &= (\theta_{08} \quad \theta_{09} \quad \theta_{10} \quad \theta_{11} \quad \theta_{12} \quad \theta_{13} \quad \theta_{14} \quad \theta_{15}). \end{aligned} \tag{16}$$

Applying matrix multiplication to the two vectors as suggested by the econometric models in Subsection 4.4 (Wooldridge 2009, 790–91), leads to a scalar result. This scalar is equal to the coefficient estimate of the categorical variable indicating the year the observation falls into. An example is given. For subsidiary i in year 2011, the vector $\boldsymbol{T}$ is $\boldsymbol{T}_{i11}$ = (0 0 0 1 0 0 0 0). Multiplying $\boldsymbol{T}_{i11}$ with the corresponding vector $\boldsymbol{\theta}_{it}$, $\boldsymbol{\theta}_{i11}$, is equal to the coefficient estimate for θ_{11}. The resulting estimation equation is the same as if the categorical variables indicating the year had been added as individual variables.

When FE estimation is used, it is not possible to estimate coefficients for the categorical industry variables as this information is captured by the subsidiary-fixed effect ρ_i. Therefore, industry-year dummies are used as a substitute (for example Dischinger, Knoll, and Riedel 2014, 259). This is done by interacting the industry dummies with the year dummies. Each industry has now 8 dummy variables equal to 1 if the observation falls into that industry in that year and 0 otherwise. The year 2007 and industry C are dropped because of multicollinearity (only the industries C and G are used in the main analysis). Doing so results in 8 industry-year dummy variables. The vector $\boldsymbol{U}_{it}$ of dimensionality (1x8) contains the industry-year dummy variables and the vector ξ_{it} of dimensionality (8x1) contains the corresponding coefficient estimates. The same comments as for the time dummy variables apply when it comes to estimation. The vectors are shown below and the vector ξ_{it} is transposed.

$$\begin{aligned} \boldsymbol{U}_{it} &= (\mathrm{G}_{08} \quad \mathrm{G}_{09} \quad \mathrm{G}_{10} \quad \mathrm{G}_{11} \quad \mathrm{G}_{12} \quad \mathrm{G}_{13} \quad \mathrm{G}_{14} \quad \mathrm{G}_{15}), \\ \boldsymbol{\xi}'_{it} &= (\xi_{\mathrm{G08}} \quad \xi_{\mathrm{G09}} \quad \xi_{\mathrm{G10}} \quad \xi_{\mathrm{G11}} \quad \xi_{\mathrm{G12}} \quad \xi_{\mathrm{G13}} \quad \xi_{\mathrm{G14}} \quad \xi_{\mathrm{G15}}). \end{aligned} \tag{17}$$

The dimensionality of these vectors changes when more industries are included. When the NACE main sectors A-I are included in robustness tests, the vector $\boldsymbol{U}_{it}$ is of dimensionality (1x64), and the vector $\boldsymbol{\xi}_{it}$ is of dimensionality (64x1). Industry A and the year 2007 being the reference categories for now. The vectors with the new dimensions are shown below.

$$\begin{aligned} \boldsymbol{U}_{it} &= (\mathrm{B}_{08} \quad \cdots \quad \mathrm{B}_{15} \quad \mathrm{C}_{07} \quad \cdots \quad \mathrm{C}_{15} \quad \mathrm{D}_{08} \quad \cdots \quad \mathrm{D}_{15} \quad \cdots \quad \mathrm{I}_{08} \quad \cdots \quad \mathrm{I}_{15}), \\ \boldsymbol{\xi}'_{it} &= (\xi_{\mathrm{B08}} \quad \cdots \quad \xi_{\mathrm{B15}} \quad \xi_{\mathrm{C08}} \quad \cdots \quad \xi_{\mathrm{C15}} \quad \xi_{\mathrm{D08}} \quad \cdots \quad \xi_{\mathrm{D15}} \quad \cdots \quad \xi_{\mathrm{I08}} \quad \cdots \quad \xi_{\mathrm{I15}}). \end{aligned} \tag{18}$$

Table 16 shows which industries are used at different stages of this thesis. The industry classification is taken from the European Commission (2008, 57). Industries C and G are used in the main analysis, and industries A-I are used in robustness tests.

Table 16 Structure of NACE rev. 2 main sectors

Letter	Used in main analysis	Used in robustness checks	Description
A	NO	YES	Agriculture, forestry and fishing (acts as the reference category)
B	NO	YES	Mining and quarrying
C	YES	YES	Manufacturing
D	NO	YES	Electricity, gas, steam and air conditioning supply
E	NO	YES	Water supply, sewage, waste management and remediation activities
F	NO	YES	Construction
G	YES	YES	Wholesale and retail trade, repair of motor vehicles and motorcycles
H	NO	YES	Transportation and storage
I	NO	YES	Accommodation and food service activities
J	NO	NO	Information and communication
K	NO	NO	Financial and insurance activities
L	NO	NO	Real estate activities
M	NO	NO	Professional, scientific and technical activities
N	NO	NO	Administrative and support service activities
O	NO	NO	Public administration and defense, compulsory social security
P	NO	NO	Education
Q	NO	NO	Human health and social work activities
R	NO	NO	Arts, entertainment and recreation
S	NO	NO	Other service activities
T	No obs.	No obs.	Activities of households as employers, undifferentiated goods- and service-producing activities of households for own use
U	No obs.	No obs.	Activities of extraterritorial organizations and bodies

Source: own table, the industry classification is from the European Commission (2008, 57).

B.2 Hausman specification test

A Hausman specification test is carried out to decide whether FE or RE estimation is appropriate. The test is carried out for regression (2) in Table 6, and a corresponding RE estimation.[38] The basic idea of this test is to compare the FE estimates with the RE estimates. In case the estimates differ, FE is the appropriate estimation method (Wooldridge 2002, 288). The Hausman specification test can be interpreted as a test to verify the RE assumption that the subsidiary-fixed effect (ρ_i in this case) is uncorrelated with each of the explanatory variables, i.e. whether $E(\rho_i \mid X_{it}) = 0$ holds (Hausman 1978, 1263). This assumption needs to be made when applying RE estimation (Wooldridge 2009, 489). If this assumption is violated, only the FE estimates will be unbiased, whereas if the assumption holds, FE and RE estimates should not differ largely (Hausman 1978, 1263). To perform the test in Stata, the null and alternative hypothesis are

H_0: the RE assumption holds, both the RE and FE estimators are consistent, RE is efficient, and
H_A: the RE assumption does not hold, RE is inconsistent, but FE is consistent.

Thus, if the H_0 is rejected, FE estimation is the appropriate method (StataCorp. 2015a, 940–43). Conducting the Hausman specification test in Stata gives a χ^2 test-statistic of 613.96 and the corresponding p-value is 0.00. The H_0 is rejected and the Hausman specification test indicates to use FE.

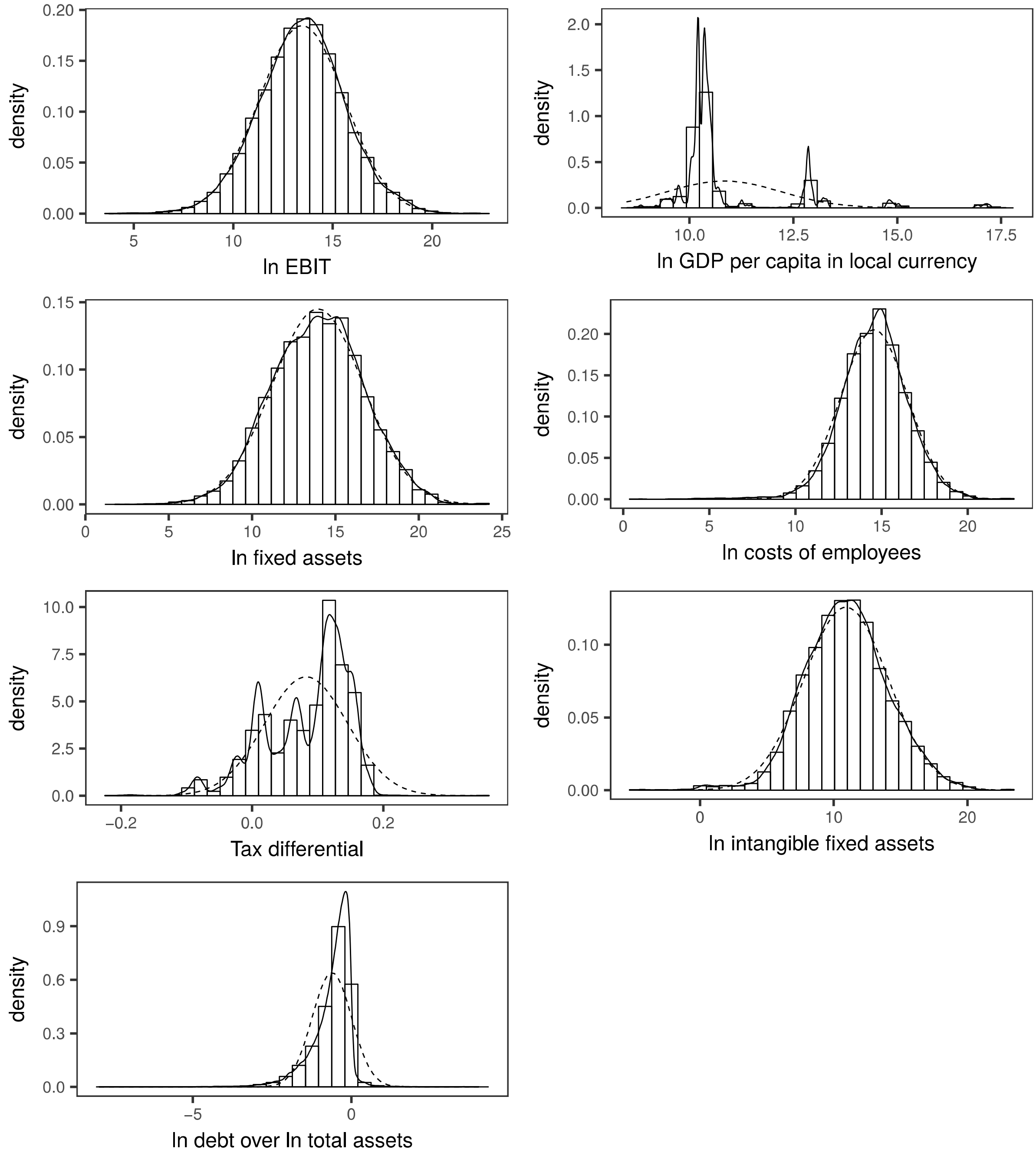
38 The test can not be carried out with clustered standard errors, therefore regular standard errors are used.

C Appendix Section 5

C.1 Distribution of main variables

See Figure 13 for the distribution of the main variables. This figure is intended to visually convey the summary statistics in Table 2 in Subsection 5.1.

Fig. 13 Distribution of main variables



Notes. The solid line represent kernel densities and the dashed lines represent normal distributions calculated using the empirical mean and standard deviations. Source: own figure.

C.2 United Nations classification of world regions

See Table 17 for the United nations classification of geographic regions (2017). Data calculations in Tables 4 and 5 as well as Figure 2, 3 and 4 are based on this classification. The ISO alpha-2 country codes are given in parentheses. Subsidiaries from a total of 63 countries are included in the sample.

Table 17 United Nations geographic regions

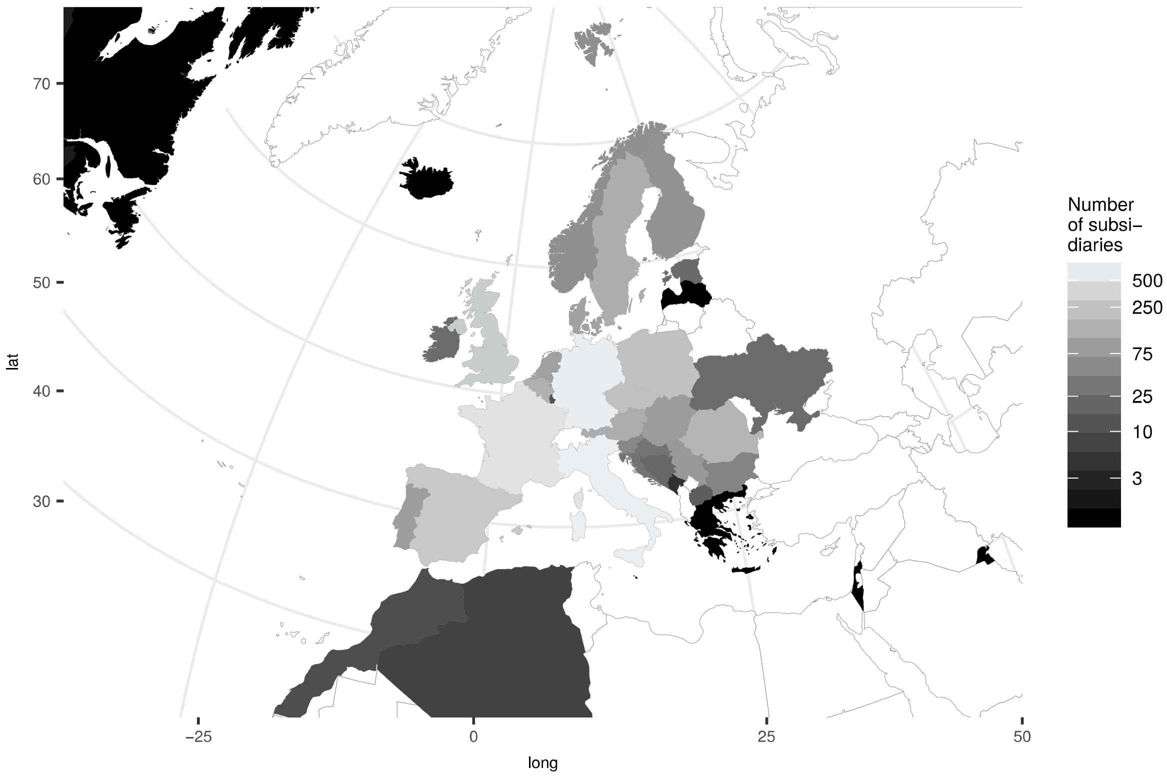
Africa (5)	Americas (9)	Asia (14)	Western Europe (6)	Eastern Europe (7)	Northern Europe (9)	Southern Europe (11)	Oceania (2)
(DZ) Algeria	(AR) Argentina	(HK) Hong Kong	(AT) Austria	(BG) Bulgaria	(DK) Denmark	(BA) Bosnia & Herze-govina	(AU) Australia
(KE) Kenya	(BM) Bermuda	(IN) India	(BE) Belgium	(CZ) Czech Republic	(EE) Estonia	(HR) Croatia	(NZ) New Zealand
(MA) Morocco	(CA) Canada	(ID) Indonesia	(FR) France	(HU) Hungary	(FI) Finland	(GR) Greece	
(NG) Nigeria	(CL) Chile	(IL) Israel	(DE) Germany	(PL) Poland	(IS) Iceland	(IT) Italy	
(ZA) South Africa	(CR) Costa Rica	(JP) Japan	(LU) Luxembourg	(RO) Romania	(IE) Ireland	(MK) Macedonia	
	(EC) Ecuador	(KW) Kuwait	(NL) Netherlands	(SK) Slovakia	(LV) Latvia	(MT) Malta	
	(JM) Jamaica	(MY) Malaysia	(CH) Switzerland[a]	(UA) Ukraine	(NO) Norway	(ME) Montenegro	
	(US) United States	(PK) Pakistan			(SE) Sweden	(PT) Portugal	
	(UY) Uruguay	(PH) Philippines			(GB) United Kingdom	(RS) Serbia	
		(KR) Republic of Korea				(SI) Slovenia	
		(SG) Singapore				(ES) Spain	
		(LK) Sri Lanka					
		(TH) Thailand					
		(AE) United Arab Emirates					

Notes. [a]Switzerland's listing is informational only, Swiss subsidiaries are not included in the sample. Source: own table.

C.3 Spatial distribution of subsidiaries in Europe

See Figure 14 for the detailed map of Europe. This map complements the world map in Figure 2 in Subsection 5.1. The purpose is to give a more detailed view on Europe, where most of the subsidiaries of Swiss MNEs are incorporated.

Fig. 14 Spatial distribution of subsidiaries in Europe



Notes. Countries with no subsidiaries are blank. The number of subsidiaries is presented in Table 4. The number of subsidiaries have been log-transformed to get a meaningful color scale. Source: own figure.

C.4 National tax rate peculiarities

See Table 18 for peculiarities in national tax rates provided by KPMG (2017). Due to space considerations, only peculiarities for the calculation of European tax rates are shown. It is further described how the calculation of the tax rates potentially affects the shifting incentive. Of special concern are the variations in tax rates in Germany and Switzerland. German subsidiaries make up 13.5% of the sample (see Table 4 in Subsection 5.1) and a detailed treatment of the tax differential of German subsidiaries might improve the analysis. The tax rate of Switzerland is of greater influence as it affects the tax differentials of all observations. The same argument applies to the other countries listed in Table 18, due to the low number of subsidiaries the influence is expected to be of smaller extent. However, a tax treatment based on the exact location of subsidiaries and parent firms is outside the scope of this thesis and therefore neglected.

Table 18 National tax rate peculiarities

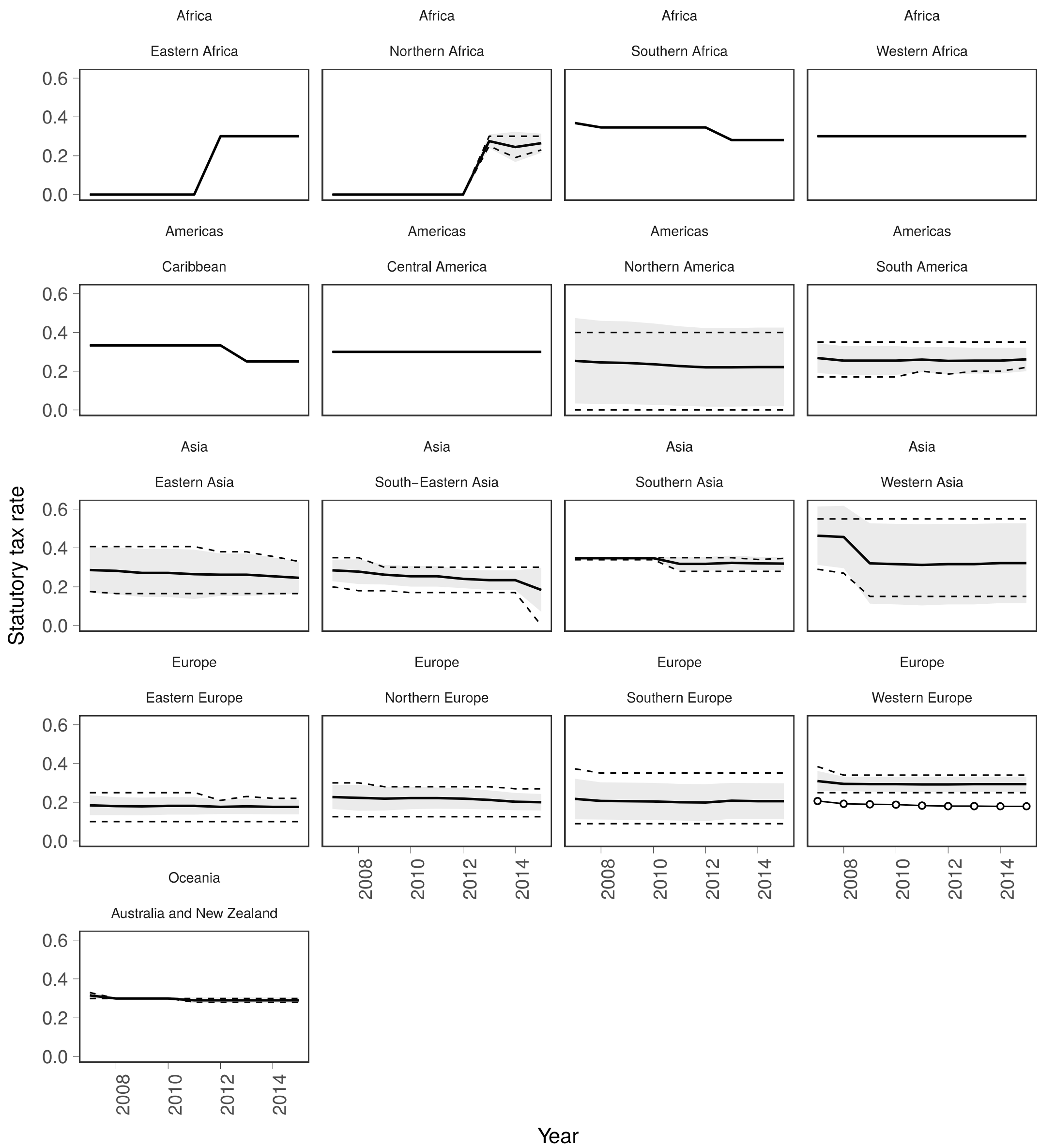
Country	CITR 2015[a]	Peculiarities in the tax system potentially affecting the empirical analysis
Austria	25%	Worldwide taxation in Austria. No tax benefit from income shifting unless appropriate double taxation relief methods are in place.
Bosnia & Herzegovina	10%	Worldwide taxation in Bosnia & Herzegovina. No tax benefit from income shifting unless appropriate double taxation relief methods are in place.
Croatia	20%	Various tax favors available, partly depending on the region of incorporation. The tax differential varies across regions and the tax incentive might be over- or understated depending on the exact location of the subsidiary.
Germany	29.72%	The tax rate consists of an income tax rate of 15%, a solidarity surcharge of 0.825% and a local trade tax varying between 7% and 17.15%. The tax differential varies across regions and the tax incentive might be over- or understated depending on the exact location of the subsidiary.
Latvia	15%	Tax benefits for firms operating in special economic zones. The tax differential might vary across regions and the tax incentive might be over- or understated depending on the exact location of the subsidiary.
Luxembourg	27.08%	Differing municipal business taxes vary by location. The tax differential varies across regions and the tax incentive might be over- or understated depending on the exact location of the subsidiary.
Macedonia	10%	Worldwide taxation in Macedonia. No tax benefit from income shifting unless appropriate double taxation relief methods are in place.
Switzerland	17.92%	Cantons apply different tax rates and municipal taxes vary across regions and time. The tax differential varies across regions and the tax incentive might be over- or understated depending on the exact location of the parent firm.

Notes. The information is available in the footnotes to KPMG's corporate tax rate tables online (2017). Tax benefits granted depending on the industry-affiliation of the firm are neglected since the main analysis includes only subsidiaries from the manufacturing and wholesale and retail industry, where sector specific tax benefits are rarely granted. [a]This is the CITR that is used in the empirical analysis. Source: own table.

C.5 Detailed tax rate graphs for all world regions

See Figure 15 for the detailed tax rate graphs. Figure 15 complements Figures 3 and 4 in Subsection 5.1. The European panels are equal to Figure 4. Due to the low number of countries in certain regions, the graphs might not always be useful (e.g. minima and maxima equal to the average tax rates).

Fig. 15 Corporate tax rates across the world (detailed world regions)



Notes. Solid black lines represent unweighted mean tax rates, dashed lines depict minimum and maximum tax rates, and the shaded area shows the mean tax rate ± 1 standard deviation. The circled line depicts the Swiss tax rate. Tax data is taken from KPMG (2017). Countries are assigned to geographic regions based on United Nations (2017), see Appendix C.2. Source: own figure.

C.6 Variables overview and datasources

See Table 19 for the variables and datasources. Interaction terms are constructed using the variables listed below and are therefore not listed.

Table 19 Variables overview and datasources

Variable	Description	Measurement	Datasource
Π_{it}	Total income	EBIT, P/L before tax (robustness)	ORBIS ORBIS
A_{it}	Technology input	GDP per capita (in local currency units)	World Bank
L_{it}	Labor input	Costs of employees, Number of employees (L_N_{it}, robustness)	ORBIS ORBIS
K_{it}	Capital input	Fixed assets, Tangible fixed assets (TK_{it}, robustness)	ORBIS ORBIS
K_d_{it}	Capital input	$K\_d_{it} = 1$, if ln fixed assets are above mean; $K\_d_{it} = 0$, otherwise	ORBIS
τ_{it}	Tax differential	Subsidiary tax rate minus parent tax rate, $(r_{it} - r_{ht})$	KPMG[a], Aswath Damodaran
I_{it}	Intangibles	Intangible fixed assets	ORBIS
I_d_{it}	Intangibles	$I\_d_{it} = 1$, if ln intangible fixed assets are above mean; $I\_d_{it} = 0$, otherwise	ORBIS
$Case2_{it}$	Shifting direction	$Case2_{it} = 1$ if the shifting direction is to the parent ($r_{it} > r_{ht}$), and $Case2_{it} = 0$ otherwise	KPMG
OW_51_{it}	1st ownership variable	$\text{OW\_51}_{it} = 1$ if the subsidiary is owned with a share between 51 and 99.99% and $\text{OW\_51}_{it} = 0$ otherwise	ORBIS[b]
OW_100_{it}	2nd ownership variable	$\text{OW\_100}_{it} = 1$ if the subsidiary is wholly-owned and $\text{OW\_100}_{it} = 0$ otherwise	ORBIS[b]
LEV_{it}	Leverage	Ratio of ln debt over ln total assets	ORBIS
GDP_G_{it}	GDP growth	Percentage	World Bank
T_CY_{it}	Time in years	Calendar year, ranging from 2007 to 2015	ORBIS
$[a]\_d_{it}$	World region	Categorical variables indicating the world region, $[a]\_d_{it} = 1$ if the observations falls into that region, and 0 otherwise, with $a \in \{\text{Americas, Asia, Europe, Oceania}\}$.	ORBIS, United Nations
$[b]\_d_{it}$	Region within Europe	Categorical variables indicating the region within Europe, $[b]\_d_{it} = 1$ if the observations falls into that region, and 0 otherwise, with $b \in \{\text{Northern\_Europe, Southern\_Europe, Western\_Europe}\}$.	ORBIS, United Nations

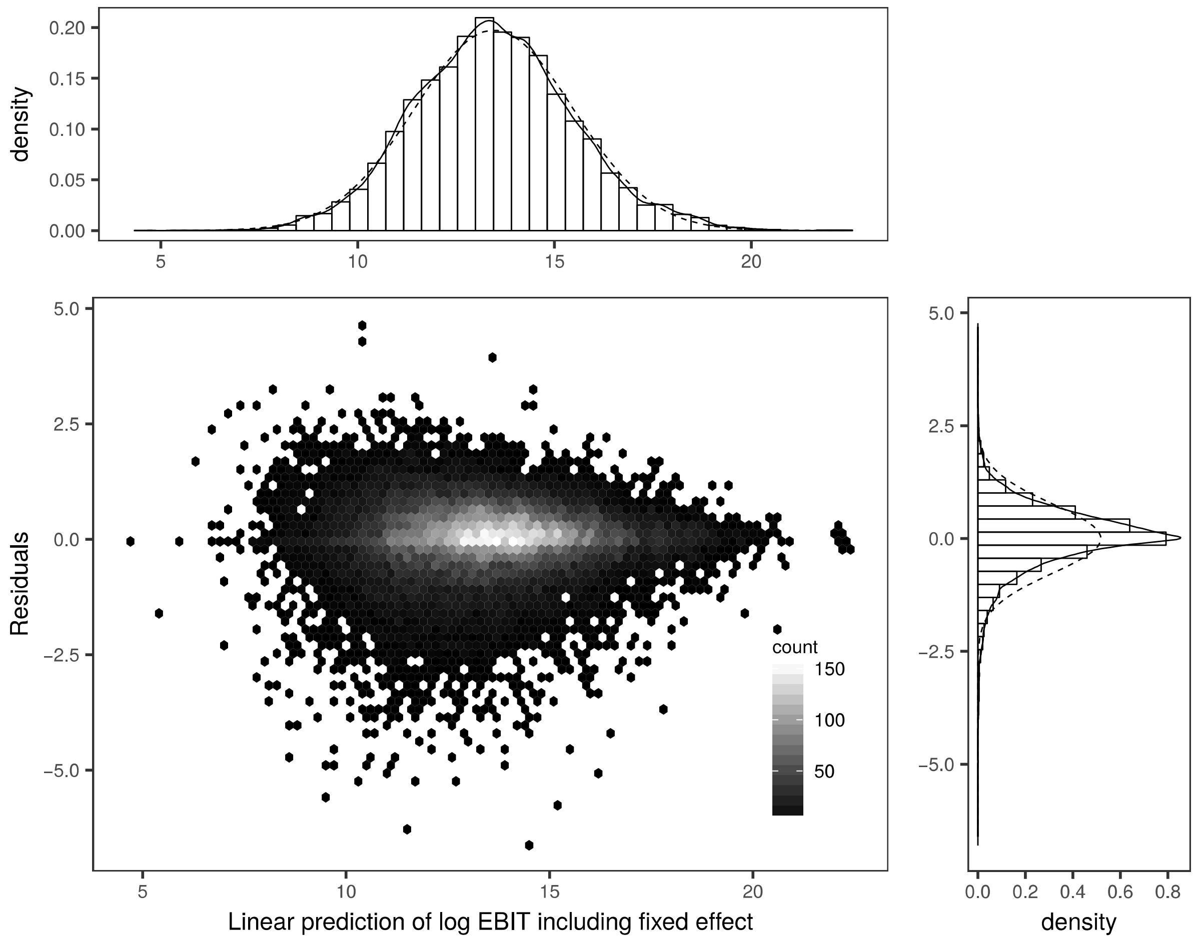
Notes. [a]KPMG does not provide an export function. Damodaran's website is used to download the data, http://people.stern.nyu.edu/adamodar/New_Home_Page/datafile/countrytaxrate.htm.
[b]Subsection 5.1 explains how the two categorical ownership variables have been constructed. Source: own table.

D Appendix Section 6

D.1 Regression diagnostics

FE estimation is equivalent to pooled OLS on time-demeaned data (Wooldridge 2009, 482). Thus, assessing the appropriateness of a model is similar as with a standard OLS model. The FE regression assumptions as defined by Stock and Watson (2012, 404–6) are: the error term u_{it} has conditional mean zero, the observations are independently and identically distributed (i.i.d.), large outliers are unlikely and no perfect multicollinearity is present. The first assumption is given most attention since it ensures unbiasedness of the estimator (Stock and Watson 2012, 238, 404). All regression diagnostics are based on the benchmark regression (2) from Table 6.

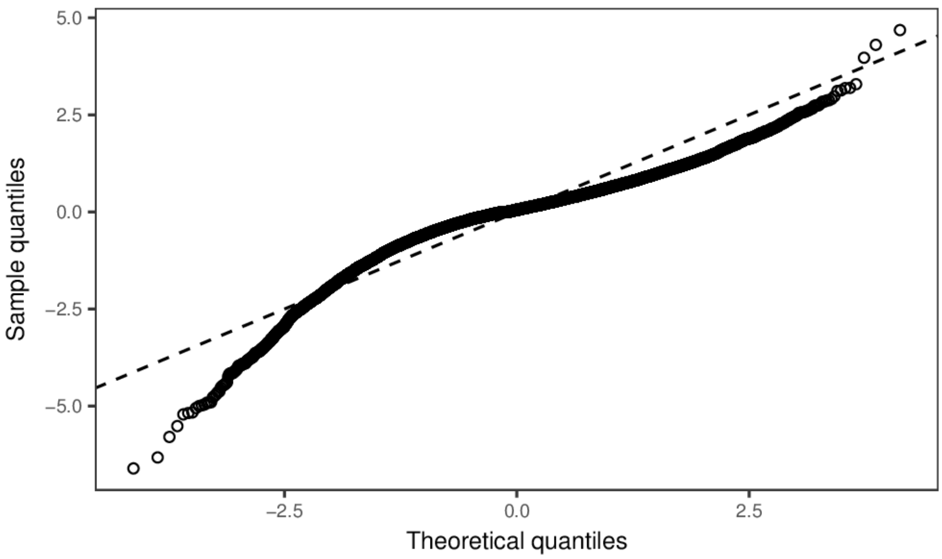
Fig. 16 Scatterplot of residuals against prediction including fixed effect



Notes. The scatterplot shows the residuals against predicted values of ln EBIT. The prediction is calculated using coefficient estimates from regression (2) in Table 6 including the subsidiary-fixed effect. The top and right plot show histograms for the linear prediction of ln EBIT and the residuals. Solid lines represent the kernel density of the empirical distribution and dashed lines depict the corresponding normal density. Source: own figure.

Figure 16 shows the residuals plotted against the predicted values of ln EBIT, including the fixed effect. The greyscale and the hexagon plot form provide helpful and allow to identify where the majority of observations is situated. Each hexagon contains the number of observations as indicated by the scale. Most observations are spread equally across the zero-line, indicating that the residuals u_{it} suit the conditional mean assumption reasonably well (Stock and Watson 2012, 164). Figure 16 further shows that heteroscedasticity appears to be present among the residuals. Residuals corresponding to predictions between 10 and 15 show higher variability than the residuals corresponding to lower and higher predictions. As a consequence, clustered standard errors robust to heteroscedasticity and serial correlation are used for all regression specifications (Stock and Watson 2012, 404; Hoechle 2007, 285). The histogram of the residuals further shows that the residuals are not normally distributed. The kernel density of u_{it} has less probability mass at the centre, and shows a higher than normal probability of large, negative residuals. The non-normality of the residuals is pronounced in a quantile-quantile (Q-Q) plot in Figure 17.

Fig. 17 Quantile-quantile plot of residuals from regression (2) in Table 6

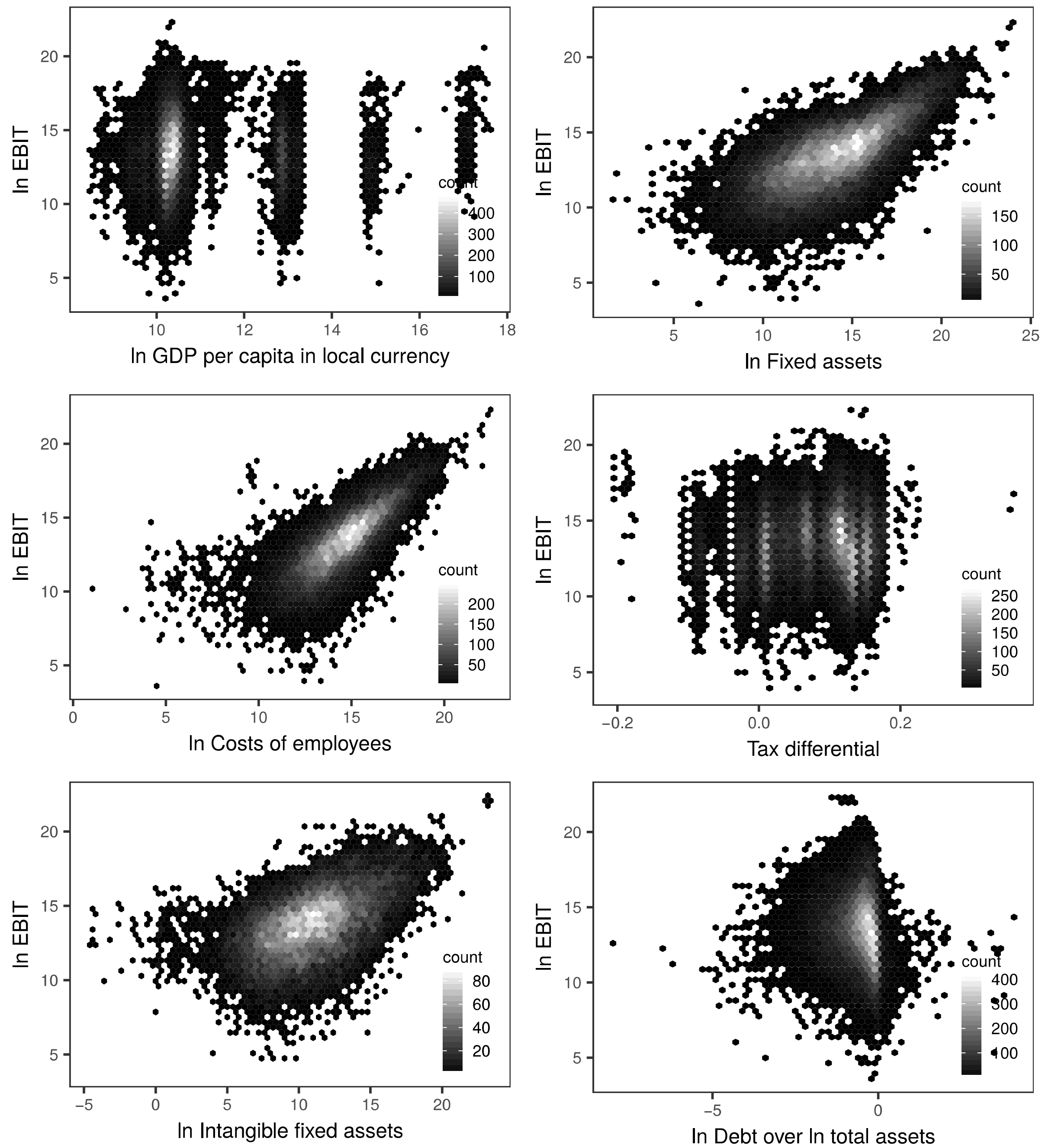


Source: own figure.

The Q-Q plot shows a heavy-tailed distribution of the residuals. Normality of the residuals is clearly not given, however, asymptotic approximations can be relied on since the number of observations (26'869) is high and the number of time periods (9) is small (Wooldridge 2009, 504). The model is kept in its form as in regression (2) in Table 6.

Figure 18 plots the main independent variables against the dependent variable. The scatterplots allow to judge the linearity of the relationship between the two variables in question. Linearity is not considered a problem. The scatterplot of the tax differential and the EBIT might indicate a slight curvature. However, including a squared term of the tax differential does not improve the econometric model (see regression (4) in Table 6). The other scatterplots show reasonably linear relationships between the dependent and independent variables.

Fig. 18 Scatterplots of main variables against dependent variable



Source: own figure.

D.2 Additional comments to the intangibles interaction in Table 7

These comments concern regression (4) in Table 7. The marginal effects of the tax differential are -0.639 (-1.124**) for subsidiaries with below (above) mean ln intangible fixed assets. The insignificant coefficient of -0.485 of the interaction term tells that there is no significant difference between the two effects. Brambor, Clark, and Golder (2006, 70) mention that this case can occur if the covariance between the interaction term and the tax differential is negative. Thinking of CIs is useful in the case here. The 90% CI of the interaction term is given by $-0.485 \pm 1.645 \times 0.452 = [-1.229, 0.259]$[39] and includes 0. The 90% CIs for the marginal effects are given by $[-1.603, 0.324]$ for subsidiaries with below mean ln intangible fixed assets and by $[-1.989, -0.259]$ for subsidiaries with above mean ln intangible fixed assets. The latter of the two does not include 0, meaning the effect is significant. However, the CIs of the two marginal effects overlap, and thus confirm the insignificant difference as suggested by the CI of the interaction term. The CIs illustrate that the interaction term and the marginal effects test different hypotheses. It is therefore entirely possible that they show differences in significance. Further, it should be noted that if a higher cutoff value of ln intangible assets is chosen to separate the subsidiaries into two groups, it is likely that the interaction term would show a significant coefficient. This reasoning is based on the right graph in Figure 7, which shows that only subsidiaries with high intangible asset endowments engage in significant income shifting activities. The arguments based on CIs made here apply equivalently to other regressions showing the same patterns of significance.

D.3 Additional comments to the shifting direction interaction in Table 7

The pattern of results from regression (7) in Table 7 is equivalent to regression (4) from the same table. While the coefficient estimate of the direction interaction is insignificant, the marginal effect for subsidiaries with shifting direction to the parent is significant. The marginal effect for subsidiaries with shifting direction away from the parent is insignificant. Even though this result is possible and the conclusions valid (see Brambor, Clark, and Golder (2006, 70), and the comments in Appendix D.2), a more detailed, industry-specific treatment could bring more clarity. The results of reestimating regression (7) in Table 7 on the subsamples of manufacturing subsidiaries and subsidiaries in the wholesale and retail industry are

39 The formula for a 90% confidence interval is given by $\beta_i \pm 1.645 \times SE(\beta_i)$, and can be found for example in Wooldridge (2009, 138).

shown in Table 20. The results suggest that income shifting behavior is different across industries. Moreover, the significant shifting direction interaction of one industry probably offsets the reversed significant shifting direction of the other industry when analyzing both industries in one regression. Results from splitting the two subsamples according to $Case2_{it}$ are similar but not reported. However, industry-related questions are outside the scope of this thesis and are left to upcoming research.

Table 20 Shifting direction interaction from Table 7 in greater detail

Subsidiary-fixed effects, panel 2007-2015, dependent variable: ln EBIT, (Π_{it}^{T})		
Industry	C: manufacturing	G: wholesale, retail
Explanatory variables	(1)	(2)
ln GDP per capita, (A_{it})	0.084	0.545**
	(0.498)	(2.305)
ln fixed assets, (K_{it})	0.055**	0.062***
	(2.520)	(4.235)
ln cost of employees, (L_{it})	0.618***	0.368***
	(11.695)	(8.717)
Tax differential, (τ_{it})	1.591	-7.623***
	(1.056)	-(3.046)
Shifting direction, ($Case2_{it}$)	0.081	-0.019
	(0.807)	-(0.218)
Direction interaction,	-3.715**	6.597**
(τ_{it} x $Case2_{it}$)	-(2.104)	(2.496)
Year dummies	√	√
Industry-year dummies		
No. of observations	12'356	14'513
No. of subsidiaries	2'163	2'699
Within R^2	0.081	0.059
Overall F-test	25.594	23.210

Notes. Regression (1) and (2) are based on regression (7) in Table 7 with limitations on industries included. Regression (1) includes only subsidiaries from the manufacturing industry and regression (2) includes only subsidiaries from the wholesale and retail industry. *, **, *** denotes significance on the 10, 5, 1% significance level. *t*-statistics are reported in parenthesis and standard errors are clustered at the subsidiary level to control for heteroscedasticity and autocorrelation (Hoechle 2007, 285). Source: own table.