Effects of taxation on European multi-nationals' financing and profits*

Stefan Lutz**

University of Manchester, UK; Universidad Complutense de Madrid, Spain;
I.R.E.F., Luxembourg

April 2013

Important determinants of multinational firms' choice of location include, besides resource cost and infrastructure, the taxation regime through its effects on international pricing and profits. This paper investigates the effects of tax rates on firms' profits and financing decisions by analyzing a panel of several hundred thousand European firms for the years 1985 to 2010. Results indicate that taxation has a negative effect on overall firm profits but not on returns on shareholder funds. This is consistent with the observed positive effect of corporate taxation rates on the gearing ratio, i.e. the higher corporate tax rates in a particular jurisdiction the lower the share of equity financing of firms residing in that jurisdiction. This may indicate that high-tax jurisdictions deter valuable investment by multinational enterprises because they provide incentives to locate value-driving business parts requiring more equity financing elsewhere.

JEL classification: G0, H3, F2

Keywords: MNE, DCF, capital structure, corporate income tax, transfer pricing

---

* This paper is based on a previous working paper version presented at the Institute for Research in Fiscal and Economic Issues (I.R.E.F.) workshop at Università di Torino on 30 November 2012. The views expressed in this paper are those of the author and do not necessarily reflect those of the institutions he is affiliated with. The author would like to thank Mina Baliamoune-Lutz , Enrico Colombatto, Elisa Luciano, Giovanna Nicodano, Mario Pagliero, Luigi Benfratello, Andreas Höfer, and Andreas Oehler for helpful comments and suggestions as well as Keshav Goel for diligent research assistance. Financial support by I.R.E.F. is gratefully acknowledged.

** Correspondence: University of Manchester, UK, eMail: stefan.lutz@manchester.ac.uk.

1. Introduction

International restructurings by globally acting enterprises have become a common occurrence in the wake of accelerating globalization and have led to increasing global relocations of economic activities. Besides resource cost and infrastructure, the taxation regime is an important determinant of the geographical development of globalization.

The tax regime ultimately affects the profits of a firm, but it also affects the capital structure, i.e. the mix between debt and equity financing of firms, the co-called gearing ratio (or leverage ratio). The capital structure, in turn, affects the entrepreneurial function that can be taken on by a particular enterprise. For example, highly innovative firms using and developing cutting-edge intellectual property tend to need more equity financing than firms performing mature routine functions. Hence the taxation regime may hinder or promote firms' location of highly innovative industries in a particular jurisdiction by making debt financing more or less attractive relative to equity financing. So far, however, the empirical literature has presented mixed results.

The research presented here analyzes a very comprehensive data set obtained from the Amadeus firm-level data base as well as from the OECD spanning a panel of 240,000 firms from 24 European countries for the years 1985 to 2010. By exploiting this extraordinarily rich data set, we reach two important results:

- A rise in corporate income tax, irrespective of how they are measured, encourages companies to increase their borrowing (debt) and to reduce their reliance on equity (risk-capital).
- While tax increases reduce profit levels and margins, they have mixed effects on the remuneration of equity, since the underlying equity is also reduced.

The remainder of the paper is structured as follows. Section 2 introduces the economic and

institutional background, the resulting research questions, as well as the hypotheses to be investigated. The underlying theoretical framework is summarized in Section 3. Section 4 describes the data used. Section 5 presents the general modeling and summarizes the results. Section 6 concludes.

2. Background and research questions

The theoretical arguments for the tax sensitivity of capital structures focusr on the value of the tax shield implied by interest rate deductions[1] (Modigliani/Miller, 1963). Accordingly, higher taxes should lead, ceteris paribus, to higher debt/equity ratios (gearing ratios). Several theoretical models explain these choices: see for instance Kraus/Litzenberger (1973) on financial distress, or Jensen/Meckling (1976) and Myers (1977) on agency issues. In this vein, Wrede (2010) finds that under separate accounting, multinational enterprises adopt tax-efficient capital-to-debt ratios and tend to shift debt from low-tax to high-tax countries.[2] Moreover, Weichenrieder (1996) shows that an increase in the tax rates on foreign dividends may result in a lower cost of capital for the foreign subsidiary[3]. Luciano/Nicodano (2011) demonstrate that tax rates affect not only the extent of inter-company lending within multinational enterprises, but also the level of guarantees provided by the parent company,[4] while Da Rin et al. (2011) present evidence that higher effective corporate tax rates reduce entry rates of firms in European countries.

[1] The tax shield arises from income tax deductibility of debt financing whereas returns to equity are subject to corporate income tax.

[2] Wrede (2010) is based on previous work by Mintz and Smart (2004), Huizinga, Laeven, and Nicodeme (2008), Schindler and Schjelderup (2008) and Hauer and Runkel (2009) who developed theoretical models of the tax-efficient debt financial policies of multinationals. Desai, Foley, and Hines (2004) show that U.S. multinationals adapt capital-debt compositions in response to tax incentives. Huizinga, Laeven, and Nicodeme (2008) observe for European multinational firms that the leverage ratio is more sensitive to taxation on account of international debt shifting than it is for stand-alone domestic firms.

[3] An increase in the taxation of foreign dividends may induce multinationals to reduce equity financing of its foreign subsidiaries and thereby increase the gearing ratio which in turn reduces total cost of capital since debt financing is less expensive than equity financing.

[4] For a recent overview of related work see Gordon (2010).

Despite a wealth of studies, the empirical evidence regarding tax effects on capital structure remains ambiguous (Feld et al., 2011). Da Rin et al. (2010) present evidence that higher effective corporate taxes lead to entry of higher leveraged firms. However, other studies using average effective tax rates, such as Booth et al. (2001), tend to find negative or insignificant effects of tax rates on debt financing. Other studies, such as Gordon/Lee (2001, 2007) use statutory income tax rates and find mixed results. While studies such as Faccio/Xu (2011) find that statutory tax rates are significant determinants of capital structure, while other studies such as Bond/Xing (2010) state that statutory or average effective tax rates contain little additional information, once the tax-adjusted user cost of capital is taken into account.

This paper investigates the effects of both statutory and individual effective corporate tax rates on firms' financing decisions as well as profit levels. Following the literature, the effect of tax rates is first analyzed at the aggregate country level by using average gearing ratios, average effective corporate tax rates, and per-country statutory corporate tax rates. In a second step, the effect of taxation at the level of the individual firm is investigated by using statutory corporate tax rates and individual effective tax rates. Lastly, the implications for international transfer pricing are discussed. For the purpose of national taxation of MNEs, transfer pricing is utilized in order to determine the taxable profit of a national subsidiary by comparing its profits to those of hypothetically comparable independent firms. Similarly, international transfer pricing is used to determine the acceptability of a financing structure for tax purposes, i.e. to determine whether and to what extent intercompany debt financing can be tax deductible. [5]

[5] See OECD (1995/2001/2010) transfer pricing guidelines and the OECD (2012) discussion draft on chapter VI (intangibles).

3. Theoretical framework[6]

In the adjusted present-value approach, the optimal gearing ratio (debt/equity) maximizes the overall value of the firm, where the overall firm value is determined as the unlevered firm value, plus tax benefits of debt, minus the expected bankruptcy cost of debt.[7]

When valuing an individual firm, its equity, or any other risky asset, the discounted cash flow method[8] (DCF) is frequently used. Since DCF consists in discounting future cash earnings, an appropriate discount rate needs to be applied. The discount rate represents the (opportunity) cost of capital invested; if the cash flows valued are those accruing to equity (FCFE), i.e. after deduction of any costs of debt financing, then the discount rate represents the cost of equity financing or the required (minimum) expected return to equity (RoE).[9] This RoE consists of the sum of the risk-free rate of interest and the equity risk premium (ERP), which can be derived with recourse to the Capital Asset Pricing Model (CAPM)[10]. According to the standard convention in the CAPM, the required return for any asset i, r_i, can be expressed as the sum of a risk-free return and the excess of the market return to the risk-free return multiplied by the covariance between the individual return of asset i and the market return.

If asset i is a particular firm financed with a debt-to-equity ratio of δ_i and taxed at rate τ, then the excess of the market return to the risk-free return needs to be multiplied by $(1 + (1- \tau))\bullet\delta_i$, which results in r_i being decreasing in the tax rate and increasing in the debt-to-equity ratio. According to Modigliani/Miller (1958), this captures the additional risk due to debt financing.

[6] See Lutz (2012c) Section 3 for a more formal derivation of the theoretical results presented here.

[7] See, e.g., Damodaran (2011a).

[8] See, e.g., Brealey/Myers/Allen (2006) chapters 4 or 8, Luenberger (1998) chapter 7 for an introduction.

[9] FCFE is widely used and can be particularly useful for the valuation of firms with varying gearing (debt/equity financing) ratios. See, e.g., Shaw (2007), p. 15.

[10] See Sharpe (1964), Treynor (1962), Lintner (1965), Mossin (1966), and Markowitz (1959). For more recent discussions see, e.g., Perold (2004), Fama/French (2004). For a multi-period extension, see Fama (1977).

The covariance between the individual return of asset i and the market return can be decomposed into the correlation between the individual return of asset i and the market return (market correlation), and the intrinsic volatility of asset i. Note that while volatility is a significant determinant of returns, the market correlation is typically not significant. This has been shown repeatedly in capital-market studies and also seems to hold with enterprise data. In fact, empirical analyses using historical financial markets data show that the ERP paid by the capital market for the assumption of risk corresponds to a multiple of the standard deviation of the RoE. [11]

Taking this into account and treating the market return volatility as given, we can express the return of asset i as the sum of the risk-free rate of interest and a risk premium, where the latter consists of asset i's return volatility multiplied by a risk parameter α_i. The risk parameter α_i, in turn, depends on the tax rate, the debt-to-equity ratio, the market correlation, and the excess of the market return to the risk-free return.

For the firm i, let C_i be its contemporary FCFE, r_i its required return on equity (the applicable discount rate), and g_i the expected growth rate of C_i. Firm i's market value of equity will then be given by $V_i = C_i / (r_i - g_i)$ and firm i's overall value is given by the sum of V_i and the value of its debt. Note that α_i, can be derived using a measure of C_i's volatility divided by V_i. [12]

Using the adjusted present value approach and taking debt into account, firm i's market value of equity can be expressed using the free cash flow to firm (FCFF), applying the weighted cost of capital (WACC) for discounting, and then subtracting the debt. Then, firm i's market value of equity is determined by its FCFF E_i, the tax rate τ, its debt D_i, the interest rate r_i^d on debt, the

[11] See Damodaran (2011b), Lutz (2012a), Lutz/Kleinfeldt (2012).

[12] This formulation allows for the joint determination of firm value and discount rate when the applicable discount rate is not known, e.g. when valuing firms that are not publicly quoted; see Lutz (2012b).

risk-free rate of return r_f, the individual risk parameter α_i, the volatility of return to equity σ_i and the growth rate g_i.

As a reuslt, the optimal debt level (gearing ratio) maximizes V_i, i.e. it solves

$$(1) \quad \frac{\partial V_i}{\partial D_i} = \frac{(r_f + \alpha_i \sigma_i) - (1-\tau) r_i^d}{r_f + \alpha_i \sigma_i - g_i} - 1 = 0 .$$

With r_i^d increasing in debt[13], debt will be chosen such that

$$(2) \quad r_i^d = g_i /(1-\tau)$$

Hence, the higher the tax rate, the higher debt and gearing. Note that the use of some debt financing is beneficial even at zero tax rates. This is so since the mix provides for a diversification between lower-cost debt financing with repayment obligation in case of default , and higher-cost equity financing without such a repayment obligation.

Furthermore, we have

$$(3) \quad \frac{\partial V_i}{\partial \tau} = -\frac{E_i - D_i g_i /(1-\tau)}{r_f + \alpha_i \sigma_i - g_i} < 0$$

Which implies that an increase in the tax rate decreases firm i's market value of equity at a decreasing rate. Similarly, it can be shown that, for positive growth rates, an increase in the tax decreases (after-tax) return on equity.

4. The Data

The empirical analysis is based on firm-level data from Bureau van Dijk's AMADEUS database and from Thomson Reuters Mutual Funds Holding (s12 Master File data); these data have been provided by Wharton Research Data services (WRDS) as well as directly by

[13] As the debt to equity ratio increases, the default risk increases and lenders demand a higher interest rate.

Bureau van Dijk. Data on statutory corporate income and dividend income tax rates have been obtained from the OECD website. Further data on US and European stock, bond markets and macroeconomic indicators have been assembled from a variety of sources. A full list of the data sources utilized obtained is given in Table A.1 in the appendix, while the list of the variables used is given in Table A.2 in the appendix. Some data on tax rates as well as summary statistics for selected variables are provided in Tables A.3.1, A.3.2, and A.3.3. Table A.3.1. shows in particular that statutory tax rates have declined significantly in the OECD countries since 1985.[14]

The latest Amadeus database version (available through WRDS) contains financial data (profit and loss statement and balance sheet data) for more than 407,000 companies from 41 European countries; the corresponding data for the years 1985 to 2010 (between 1 and ten years; 5.5 years on average) were downloaded and compiled in July 2011. OECD tax data were available for 24 of those European countries. Restricting the data set to firms from those 24 countries reduced the number of companies covered to about 240,000 firms.

In particular, the Amadeus data include the following variables: company identification (name, BvD ID number, ticker, address etc.), trade and activities descriptions, industry codes (NACE 1.1 and NAICS 2002), shareholder information, year of incorporation, number of employees, profit/loss data (revenue, cost of goods sold, operating cost, EBIT, etc.), balance sheet data (total assets, working capital, shareholders funds, etc.), cash flow, enterprise value, liquidity and financing ratios, and return on shareholder funds. The data from Thomson Reuters include share prices and the number of shares outstanding.

The data allow for analyses of tax effects on several profit and return measures as well as on financial ratios such as the gearing ratio (debt-to-equity financing ratio). Firms' trade and

[14] Note that the OECD does not report additional subcentral government taxes for all countries, e.g. Italy's IRAP of about 4-5% is not included in the data. However, note that omitting the IRAP will be reflected in an increase in the Italian country effect to the extent that Italian firms are similarly affected.

activities descriptions and their industry codes were screened in order to generate indicator (dummy) variables for manufacturing, wholesale, retail, and service activities. Shareholder and independence variables were screened to create an independence indicator (dummy) variable according to the customary benchmark selection criteria. Additional dummy variables were created per country, year, and consolidation code.

Data on general macroeconomic developments and climate were taken from the Ifo Institute's collection of European economic indices as well as from Eurostat via the European Central Bank. These comprise indices for European economic climate, European capacity utilization, and European production. See Table A.3.1. in the appendix.

Data on US and European stock market and bond market returns were taken from Damodaran (2010), from the ECB, Bundesbank and CESifo websites, and from Bloomberg. These comprise the S&P 500 and the MSCI Europe stock market indices, 6-month US treasury bills, 10-year US treasury bonds, and generic Euro-area 10-year and 3-months government benchmark bonds. See Table A.3.2. in the appendix.

When appropriate, the data and variables are further discussed together with the results presented in section 4 below.

5. Modeling and results

For the preliminary analysis of the aggregate country-level data, the following general model is used:

(4) $$y_{j,t} = \alpha + \Gamma H_{j,t} + \Delta M_t + \varepsilon_{j,t} + \eta_j$$

where the dependent variable $y_{j,t}$ is the average gearing ratio, the average effective tax rate or an average profit level indicator (e.g. return on shareholder funds) of country *j* in period *t*.

$H_{j,t}$ is a vector of determinants that may vary across countries and also over time (e.g., statutory tax rates, average gearing ratio, average return on shareholder funds); M_t is a vector of period-specific determinants outside of a particular country (e.g. global economic factors and market indicators); $\varepsilon_{j,t}$ is an idiosyncratic error term that may vary across countries and also over time, and is independently distributed with E($\varepsilon_{j,t}$) = 0. η_j represents unobserved heterogeneity across countries, i.e., a country specific random effect that is independently distributed. This general specification allows for either random-effects or fixed-effects modeling, where the random or fixed effects are country-specific components.[15] See Table A.3.3. in the appendix.

For the detailed analysis of the firm-level panel data the generalized regression model is modified in the following way:

$$(5) \qquad y_{i,t} = \alpha + \mathrm{B}F_i + \Gamma G_{i,t} + \Delta M_t + \varepsilon_{i,t} + \eta_i$$

where the dependent variable $y_{i,t}$ is the individual gearing ratio, the individual effective tax rate or an individual profit level indicator (e.g. return on shareholder funds) of company *i* in period *t*; F_i is a vector of determinants specific to firm i but invariant over time (such as country, industry, functions performed, date incorporated); $G_{i,t}$ is a vector of determinants that may vary across firms and also over time (e.g., material costs, working capital, income volatility); M_t is a vector of period-specific determinants outside of a particular firm (e.g. global economic factors and market indicators); $\varepsilon_{i,t}$ is an idiosyncratic error term that may vary between firms and also over time, and is independently distributed with E($\varepsilon_{i,t}$) = 0. η_i represents unobserved heterogeneity across firms, i.e., a company specific random effect that is independently distributed.

[15] See, e.g. Greene (2002) for an introduction to fixed and random effects in panel data modeling.

This general specification allows for either random-effects or fixed-effects modeling, where the random or fixed effects are firm-specific components. The more general approach is to allow for random firm-specific effects; the case where these effects are fixed, that is determinate constants rather than random variables, is a special sub-case. The data available contain several firm-specific, time-invariant variables that can be assumed to capture a significant part of the existent fixed effects (e.g. country, industry indicators, functional dummies, etc.). Hence a random-effects specification seems to be a priori more appropriate. On the other hand, the random-effects estimation procedure assumes that firm-specific effects are uncorrelated with the independent variables and is efficient under this assumption. If the assumption is violated, the random-effects estimator is biased, while the fixed-effects estimator is still consistent.[16] Therefore, Hausman specification tests have been conducted with the null hypothesis of the random-effects model being efficient (and consistent). These tests indicate that the firm-specific effects may be correlated with the independent variables. However, since both the random- and the fixed-effects models yield qualitatively similar results, both are reported here.

In order to test the hypotheses introduced in Sections 2 and 3, several sets of regressions are run. The first set of regressions in Models (1.*[17]) present preliminary explorations of tax effects on capital structure *(gearing)* using aggregate country-level data. The second set of regressions in Models (2.*) analyses capital structure variables (*gearing)* while another set of regressions in Models (3.*) and (4.*) analyzes profit variables (*return, profit, margin*). Since various profitability indicators and several tax rate measures are positively correlated with each other[18],

[16] See, e.g., Greene (2002), Hausman (1978).

[17] "*" denotes a place holder; e.g. for models (1.1), (1.2), and so forth in table 1.

[18] See Table 3.4 in Lutz (2012c) for correlation coefficients of various profit and return on capital variables.

the results are generally robust, regardless of the variables chosen. The results of all model regressions are summarized in Tables 1 through 4 and reported below.[19]

The aggregate country level results reported in Table 1. indicate that statutory corporate income tax rates influence average gearing ratios positively: an increase in the statutory tax rate of one percentage point tends to increase the gearing ratio by between 1.1 and 3.4 percentage points. This holds true for a variety of pooled regression and random-effects panel-specifications, whereas fixed-effects models yield no stable results even for statutory tax rates. By contrast, average effective tax rates produces mixed results.

Comparing models (1.2) and (1.3) shows that a random-effects model with year and country dummies can explain more than half of the variation in the average gearing ratio (*gearing*); if the model uses only the statutory corporate income tax rate as an explanatory variable besides year and country dummies, still over a third of the variation of the average gearing ratio can be explained. Model (1.4) uses an indicator variable for tax rate changes (*d.tax_total*) as an explanatory variable. While this variable carries less information[20], the model is still able to explain close to a quarter of the variation of the average gearing ratio.

On the other hand, neither statutory tax rates nor average effective tax rates show significant negative effects on average profits and returns (not reported here). Since the available data set includes only 23 countries, this latter result may be due to a lack of data.

The results obtained using effective individual tax rates basically indicate that taxes do tend to decrease returns on shareholder funds and to increase the gearing ratio. However, statutory taxes do not seem to have a significant negative effect on returns to shareholder funds. The

[19] Additional results on the tax effects on capital structure (gearing) obtained using simple pooled OLS regressions and fixed- and random-effects models without instrumental variables are reported in Lutz (2012c).

[20] The variable d.tax_total takes a value of one (minus one) if the statutory corporate income tax rate is increased (decreased) in comparison to last year's rate. The total of 283 observations include 88 tax decreases and 26 tax increases; see table 3.2 in the appendix.

Table 1. Results summary: capital structure – country aggregates

Model	(1.1) OLS	(1.2) RE	(1.3) RE	(1.4) RE
Dep. Var.	**gearing**	**gearing**	**gearing**	**gearing**
tax_corp_income	1.9117*	3.2658***	3.4772***	
tax_dividends	-3.2455***	-1.8848***		
tax_total	3.0296***			
tax_effective		0.0325		0.1933**
employees	0.0049***	0.0054***		
solvency	-4.2433***	-4.4444***		
sharehold_liquidity	0.3784***	0.4132***		
l.solvency				-14.103***
year_incorp	1.0615*	0.6983		
independence	-186.90**	-291.75***		
manufacturing				
wholesale	-752.17***	-824.81***		-581.85***
l.active				510.77***
Observations	264	264	288	327
Countries		23	23	23
R-sq. within		02782	0.1201	0.4745
R-sq. between		0.7145	0.7046	0.6319
R-sq. overall	0.5714	0.5645	0.3712	0.4816
Prob>chi2(>F)	0.0000	0.0000	0.0000	0.0000

Notes.

(i) Model (1) pooled OLS regression; models (2), (3) random effects.

(ii) All models include a constant. Al models include year and country dummies. Country dummies: model (1): Czech Rep., Denmark, Italy, UK; model (2): Czech Rep., Denmark, Italy, UK; model (3): France, Germany, Italy, Spain, UK; model (4): France, Germany, UK.

(iii) *** denotes significant at the 1%, ** at the 5%, * at the 10% level.

results for the gearing ratio are reported in Table 2; the results concerning the returns to shareholder funds are reported in Table 3. and discussed later in this section.

Table 2. presents various instrumental variables models – random effects (RE-IV) and fixed effects (FE-IV) models – using individual effective taxation with or without statutory tax rate measures as explanatory variables. The rate of individual effective taxation (*tax_effective*) is instrumented by a variety of statutory tax rate measures together with contemporary revenue, cost, and profit measures. All estimations include a lagged dependent variable, control for yearly effects and, where appropriate, for country effects.

A positive effect of taxation on the gearing ratio can be shown to be significant regardless of how taxes are measured – either as effective individual tax rate or as statutory corporate tax rate. Model specifications typically explain 40 to 50 percent of the variation in the firm-individual gearing ratios, while both statutory tax rate variables and individual effective tax rate variables are highly significant. Model 2.4. also illustrates that the effective tax rate variable remains significant when estimated together with several statutory tax rate measures. In particular, an increase in the statutory or effective tax rate of one percentage point tends to increase the gearing ratio by between 1.6 and 3.8 percentage points.

In summary, the effect of taxation on the gearing ratio clearly emerges from the aggregate data, the firm-individual data and across a variety of model specifications and estimation techniques. The picture looks somewhat different when examining possible effects of tax rates on profit measures. Neither effective individual taxation rates nor statutory corporate tax rates seem to have a clear negative impact on the returns to equity (see Table 3).

As can be seen in model 3.4, negative and significant effective tax rate effects tend to be very small when they can be identified.

This picture changes when profit levels and profit margins (as percentage of sales) are

Table 2. Results summary: capital structure – IV models

Model	(2.1) RE-IV	(2.2) RE-IV	(2.3) FE-IV	(2.4) FE-IV
Dep. Variable	**gearing**	**gearing**	**gearing**	**gearing**
tax_corp_income				1.4095***
tax_effective	1.6311***	3.3946***	3.8612***	2.7233***
l.gearing	0.4646***	0.4482***	0.2236***	0.2243***
active	-19.355***	-17.358***		
independence	1.4668	-0.2728		
manufacturing		-21.798***		
services	6.8151***	9.1095***		
retail		-17.910***		
IFO_eur		9.0532	19.829	16.533*
sharehold_fund	-1.82e-07***	-1.59e-07***	-1.65e-07***	-1.82e-07***
l.assets	1.23e-07***	1.41e-07***	8.94e-09	1.10e-08
l.employees	0.0002			
l.profit_bef_tax	3.35e-07***	3.80e-07***	3.19e-07**	3.00e-07**
l.cash_flow	1.13e-06***	2.14e-06***	3.84e-07	3.82e-07
l.staff_cost	7.85e-07***	1.64e-06***	3.67e-07	3.49e-07
l.interest_paid	2.72e-06***	2.96e-06***	-2.39e-06***	-2.51e-06***
l.added_value	-1.17e-06***	-2.09e-06***	-3.93e-07	-3.63e-07
l.solvency	-2.10719***	-2.1456***	-1.6827***	-1.6787***
l.margin	1.12849***	1.1851***	-0.0938	-0.1424**
l.return_cap_empl	0.24198***	0.2572***	0.1689***	0.1826***
l.liquidity	1.38137***	1.7170***	0.3141**	0.2840*
l.return_assets	-1.7698***	-1.8273***	-0.6656***	-0.7482***
Observations	484266	588996	588996	576171
Groups (Firms)	112208	127318	127318	124821
R-sq. within	0.1091	0.0811	0.0625	0.0765
R-sq. between	0.5819	0.5724	0.4651	0.5027
R-sq. overall	0.5136	0.4753	0.3786	0.4180
Prob > chi2	0.0000	0.0000	0.0000	0.0000

Notes.

(i) Models (1), (2) estimated with random effects; Models (3) and (4) estimated with fixed effects. All models IV regressions with tax_effective instrumented; instruments model (1): tax_corp_income, tax_dividends, l.tax_effective, and other variables; models (2), (3): tax_corp_income, tax_targeted, tax_dividends, tax_total, d.tax_total, l.tax_effective, and others; model (4): tax_targeted, tax_dividends, tax_total, d.tax_total, l.tax_effective, and others.

(ii) All models include a constant. All models include year dummies. Models (1) and (2) include country dummies; model (1) France, Italy only.

(iii) *** denotes significant at the 1%, ** at the 5%, * at the 10% level.

(iv) Model (1) includes only observations with 0%<=tax_effective<=100%.

Table 3. Results summary: profits/returns

Model	(3.1) OLS	(3.2) RE	(3.3) FE	(3.4) RE-IV
Dep. Variable	**return**	**return**	**return**	**return**
tax_corp_income	0.0454	0.2098***		
tax_targeted	0.9884*	0.3514	1.1656**	
tax_dividends	0.0059	-0.0114		
tax_total	0.1602***	0.1980***		
d.tax_total	0.7038***	0.4419***		
tax_effective				-0.0066***
l.return	0.4848***	0.3036***	0.1448***	0.3823***
active	1.4936***	2.3146***		1.9087***
independence	-1.6454***	-2.5544***		-2.1829***
manufacturing	-1.7993***	-3.3101***		-2.6198***
services	2.4327***	3.9889***		3.2494***
retail	3.2896***	5.5742***		4.5383***
IFO_eur	-1.0237	-0.5958	-0.1092	-0.2521
sharehold_fund	-5.64e-09***	-1.23e-08***	-1.41e-08***	-9.84e-09***
l.assets	1.30e-09	-1.68e-09	3.76e-09***	-1.10e-09
l.profit_bef_tax	-9.65e-08***	-9.03e-08***	-1.03e-07***	-9.13e-08***
l.cash_flow	-3.05e-07***	-1.90e-07***	-8.85e-08***	-2.48e-07***
l.staff_cost	-2.52e-07***	-1.50e-07***	-6.60e-08**	-2.01e-07
l.interest_paid	-7.51e-07***	-6.51e-07***	-4.18e-07***	-7.26e-07***
l.added_value	2.94e-07***	1.95e-07***	1.04e-07***	2.47e-07***
l.solvency	-0.2441***	-0.323***	-0.3591***	-0.2882***
l.margin	-0.0120**	-0.0334***	-0.0234***	-0.0266***
l.return_cap_empl	0.0719***	0.0724***	0.0482***	0.0767***
l.liquidity	0.1850***	0.1596***	0.0847***	0.1675***
l.gearing	0.0030***	0.0042***	0.0047***	0.0038***
l.return_assets	0.4254***	0.2438***	0.0321***	0.3319***
Observations	645751	645751	693017	645302
Groups (Firms)		131819	149463	131646
R-sq. within		0.0720	0.0745	0.0657
R-sq. between		0.5909	0.4553	0.6060
R-sq. overall	0.4707	0.4513	0.3541	0.4571
Prob > chi2(>F)	0.0000	0.0000	0.0000	0.0000

Notes.

(i) Model (1) pooled OLS regression; model (2) random effects; model (3) fixed effects; model (4) random effects IV regression with tax_effective instrumented by tax_corp_income tax_targeted tax_dividends tax_total d.tax_total l.tax_effective, and other variables.

(ii) All models include a constant. All models include year dummies. Models (1), (2), (4) include country dummies.

(iii) *** denotes significant at the 1%, ** at the 5%, * at the 10% level.

Table 4. Results summary: profits/levels and margins

Model	(4.1) OLS	(4.2) OLS	(4.3) RE	(4.4) FE-IV
Dep. Variable	**margin**	**margin**	**profit**	**profit**
tax_corp_income	-0.0447***		-36853***	
tax_targeted	0.5945***	0.1747***		
tax_dividends				
tax_total				
d.tax_total				
tax_effective		-0.0001***		-176.15*
l.margin	0.6878***	0.6424***		
l.profit			0.2637***	0.0921***
active	0.2587***	0.1866***	123636***	
independence	-0.3489***	-0.1937***	-53439	
manufacturing	-0.4941***	-0.4954***	-84206**	
services	0.5989***	0.7879***	403796***	
retail	-0.8708**	-0.5552***	-558399***	
IFO_eur	0.0104***	0.0148***	9711.1***	
sales			0.0405***	0.0501**
operating_revenue		-3.71e-09***		
l.sharehold_fund		-6.20e-09***		
l.assets		8.73e-09***		
l.profit_bef_tax		-5.43e-09***		
l.cash_flow		-5.35e-08***		
l.staff_cost		-6.45e-08***		
l.interest_paid		-4.24e-08***		
l.added_value		5.53e-08***		
l.solvency		0.0421***		
l.return_cap_empl		-0.0007**		
l.liquidity		0.0385***		
l.gearing		0.0004***		
l.return_assets		0.0412***		
Observations	860678	690950	798958	799176
Groups (Firms)			154311	154318
R-sq. within			0.1640	0.1895
R-sq. between			0.4387	0.2855
R-sq. overall	0.4855	0.4980	0.3883	0.2975
Prob > chi2(>F)	0.0000	0.0000	0.0000	0.0000

Notes.

(i) Model (1) pooled OLS regression; models (2) and (3) random effects; model (4) fixed effects IV regression with tax_effective instrumented by tax_corp_income, l.tax_effective, and other variables.

(ii) All models include a constant. All models include year dummies. Model (3) includes country dummies: France, Germany, Italy, UK.

(iii) *** denotes significant at the 1%, ** at the 5%, * at the 10% level.

investigated. In particular, the models presented in Table 4. show that increases in both statutory tax rates and effective tax rates significantly decrease profit levels and margins.

The results presented hold across all countries in the sample. When the country variables are used, the results concerning taxation effects remain the same. Similarly, market concentration does not seem to systematically affect the results obtained.

6. Conclusions

Corporate taxation negatively affects firm's profit levels and margins. However, this seems not to be the case for returns on shareholder funds. Corporate taxation rates positively affect the gearing ratio, i.e. the higher corporate tax rates in a particular jurisdiction, the higher the ratio of debt financing to equity financing of firms residing in that jurisdiction. This suggests that increased tax rates lead to increasing gearing ratios by a decrease in equity financing such that returns to equity do not drop with profit levels.

The effects of taxation on the firms' choice of their capital structure appear significant and robust over a wide variety of specifications and for a uniquely comprehensive set of data. While the body of pre-existing literature presented ambiguous results (Feld et al., 2011), the results presented here give a clear indication and are more in line with other research projects, such as Faccio/Xu (2011). In addition, both the theoretical model and the empirical evidence presented here suggest an explanation for the diverse results received so far. Taxation reduces profit levels and sales margins as well as equity (increased gearing ratio). Since equity falls, returns on equity may not fall to the same extent as profit levels.

Interpreted in a wider context, these results indicate that high-tax jurisdictions may deter valuable investment by multinational enterprises because they provide incentives to locate value-driving business parts requiring more equity financing elsewhere.

The results obtained apply to all countries and are independent of any measures of industry concentration. Tax competition between countries matters, of course; but this effect is already accounted for in the responses to changes in the tax rates. The other country specifics (included in the estimated country effects) seem to be insignificant.

References

Bond, S. and J. Xing (2010). "Corporate taxation and capital accumulation", Oxford University, Centre for Business Taxation, WP 10/15.

Booth, L., V. Aivazian, A. Demirguc-Kunt, and V. Maksimovic (2001). "Capital Structures in Developing Countries", Journal of Finance, 56, 87-130.

Brealey, R., S. Myers and F. Allen (2006). Corporate Finance, 8th ed. (McGraw-Hill, New York).

Da Rin, M., Di Giacomo, M. and A. Sembenelli (2011). "Entrepreneurship, firm entry, and the taxation of corporate income: Evidence from Europe", Journal of Public Economics, 95, 1048-66.

Da Rin, M., Di Giacomo, M. and A. Sembenelli (2010). "Corporate Taxation and the Size of New Firms: Evidence from Europe", Journal of the European Economic Association, 8(2-3), 1-11.

Damodaran, A. (2011a), Applied Corporate Finance, 3rd ed. (Wiley, Hoboken, NJ).

Damodaran, A. (2011b), "Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2010 Edition", Stern School of Business, New York University.

Desai, M., F. Foley, and J. Hines (2004). “A Multinational Perspective on Capital Structure Choice and Internal Capital Markets”, Journal of Finance, 59, 2451-2488.

Faccio, M. And J. Xu (2012). “Taxes and Capital Structure”, SSRN Working Paper No. 1781158.

Fama, E. F. and K. R. French (2004). “The Capital Asset Pricing Model: Theory and Evidence”, Journal of Economic Perspectives, 18(3), 25-46.

Fama, E. F. (1977). “Risk-adjusted Discount Rates and Capital Budgeting under Uncertainty”, in: Journal of Financial Economics, 5, 3 - 24.

Feld, L., Heckemeyer, J. and M. Overesch (2011). “Capital Structure Choice and Company Taxation: A Meta-Study”, ZEW Discussion Paper No. 11-075.

Gordon, R.H. (2010). “Taxation and Corporate Use of Debt: Implications for Tax Policy”, National Tax Journal, 63, 151-174.

Gordon, R.H., and Y. Lee (2001). “Do taxes affect corporate debt policy? Evidence from U.S. Corporate Tax Return Data”, Journal of Public Economics, 82, 195-224.

Gordon, R.H., and Y. Lee (2007). “Interest Rates, Taxes and Corporate Financial Policies”, National Tax Journal, 60, 65-84.

Greene, W.H. (2002). Econometric Analysis (5th Edition), Prentice Hall.

Haufler, A., and M. Runkel (2009). “Firms' Financial Choices and Thin Capitalization Rules under Corporate Tax Competition," Working Paper.

Hausman, J. A. (1978). „Specification Tests in Econometrics“, Econometrica, Vol. 46, No. 6.

Huizinga, H., L. Laeven, and G. Nicodeme (2008). “Capital Structure and International Debt Shifting”, Journal of Financial Economics, 88, 80-118.

Jensen, M., and W.H. Meckling (1976). “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”, Journal of Financial Economics, 42, 159-185.

Kraus, A., and R.H. Litzenberger. (1973). “A State-Preference Model of Optimal Financial Leverage”, Journal of Finance, 28, 911-922.

Lintner, J. (1965). “The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets”, Review of Economics and Statistics, 47, 13–37.

Luciano, E. and G. Nicodano (2011). “Incorporate guarantees, leverage and taxes, Universita di Torino, manuscript.

Luenberger, D. (1998). Investment Science (Oxford University Press, New York).

Lutz, S. (2012a). “Risk premia in multi-national enterprises”, North American Journal of Economics and Finance, http://dx.doi.org/10.1016/j.najef.2012.06.016.

Lutz, S. (2012b). “Determination of market values and risk premia of multi-national enterprises and its application to transfer-pricing”, International Business Research, 5(12), http://dx.doi.org/10.5539/ibr.v5n12p.

Lutz, S. (2012c). “Effects of taxation on European multi-nationals’ financing and profits”, working paper, presented at I.R.E.F Workshop, Universita di Torino, 30 November 2012.

Lutz, S. and D. Kleinfeldt (2012). "Risk as determinant of income and cross-border pricing of multi-national enterprises", Journal of Microeconomics, 1(1), 63-97.

Markowitz, H. (1959). Portfolio Selection: Efficient Diversification of Investments, Cowles Foundation, Monograph No. 16 (John Wiley & Sons, Inc., New York).

Mintz, J., and M. Smart (2004). “Income Shifting, Investment, and Tax Competition: Theory and Evidence from Provincial Taxation in Canada," Journal of Public Economics, 88, 1149-1168.

Modigliani, F. and M. H. Miller (1963). “Corporate Income Taxes and the Cost of Capital: A Correction”, American Economic Review, 53, 433-43.

Modigliani, F. and M. H. Miller (1958). “The Cost of Capital, Corporation Finance, and the Theory of Investment”, American Economic Review, 48:3, 261–97.

Mossin, J. (1966). “Equilibrium in a Capital Asset Market” Econometrica, 35, 768–83.

Myers, S. (1977). “Determinants of Corporate Borrowing”, Journal of Financial Economics, 5, 147-175.

OECD (2012). “Discussion Draft: Revision of the Special Considerations for Intangibles in Chapter VI of the OECD Transfer Pricing Guidelines and Related Provisions“, OECD Centre for Tax Policy and Administration, published 6 June 2012.

OECD (1995/2001/2010). “Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations“, published 22 July 2010.

Perold, A. F. (2004). “The Capital Asset Pricing Model”, Journal of Economic Perspectives, 18(3), 3-24.

Peter, S. (2008). Theoretische und empirische Analyse von Margenvergleichen zur Bestimmung und Überprüfung von Verrechnungspreisen (Freiburger Dissertationsreihe).

Schindler, D., and G. Schjelderup (2008). “Multinationals, Minority Ownership and Tax-Efficient Financing Structures," Norwegian School of Economics and Business Administration Discussion Paper, 19.

Sharpe, W. F. (1964). “Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk”, Journal of Finance, 19, 425–42.

Treynor, J. L. (1962). “Toward a Theory of Market Value of Risky Assets”, unpublished manuscript. Final version in: Korajczyk, R. A. (ed.)(1999). (Asset Pricing and Portfolio Performance (Risk Books, London), 15–22.

Weichenrieder, A. J. (1996). “Transfer Pricing, Double Taxation, and the Cost of Capital“, Scandinavian Journal of Economics, 98(3), pp. 445-52.

Wrede, M. (2010). “Multinational Capital Structure and Tax Competition“, CESifo Group Munich, CESifo Working Paper Series: CESifo Working Paper No. 3041.

Appendix

Table A.1. Major data sources

#	Data type	Source	Downloaded / data	Date
1	Firm data (balance sheet, profit/loss)	Wharton Research Data services (WRDS) [21]: Bureau van Dijk	https://wrds-web.wharton.upenn.edu/wrds/ (Data set: bvd/amadeus_l)	14 June 2011
2	European economic climate index data	CESifo	(http://www.cesifo-group.de/link/wes-zeitreihen-euro-2009q4.xls (Wirtschaftsklimaindikator Euroraum, Index R1)	March 2010
3	Industrial production index data	European Central Bank	http://sdw.ecb.europa.eu/ (Eurostat, Industrial Production Index, series STS.M.I5.W.PROD.2C0000.4.000, STS.M.I5.W.PROD.NS0040.4.000, and STS.M.I5.W.PROD.NS0050.4.000, short-term statistics, monthly, fixed composition, working-day adjusted)	March 2010
4	European bonds data	European Central Bank	http://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=143.FM.M.U2.EUR.4F.BB.U2_10Y.YLD (Euro area 10-year Government Benchmark bond yield – Euro (FM.M.U2.EUR.4F.BB.U2_10Y.YLD))	July 2011
5	Statutory income tax rates	OECD	http://www.oecd.org/document/60/0,3746,en_2649_34533_1942460_1_1_1_1,00.html#C_CorporateCaptial (Basic (non-targeted) corporate income tax rates, II.1, date: 02-24-2012); http://www.oecd.org/document/60/0,3746,en_2649_34533_1942460_1_1_1_1,00.html#C_CorporateCaptial (Overall statutory tax rates on dividend income, II.4, date: 02-24-2012);	March 2012

[21] Wharton Research Data services (WRDS) was used in preparing part of the data set used in the research reported in this paper. This service and the data available thereon constitute valuable intellectual property and trade secrets of WRDS and/or its third-party suppliers.

Table A.2. List of variables

Variable	Definition
active	Dummy variable, by legal status
added_value	Added value, EUR thousand
assets	Total assets
cash_flow	Cash flow, EUR thousand
consol_<#>	Dummy variables, by BvD consolidation code, _1 if "C1", _2 if "C2", _3 if "LF", _4 if "U1", _5 if "U2"
curr	Current ratio
<Country>	Dummy variable, by <Country>
d.tax_total	Indicator tax change; taking values -1, 0, +1 for negative, no, or positive tax change, respectively
employees	Number of employeesoyees
gearing	Gearing ratio (%)
IFO_eur	IFO index, economic climate, Euro zone
independence	Dummy variable, if IndepA or IndepB or ishdirect<=25%
interest_paid	Interest paid, EUR thousand
IYear<year>	Dummy variable, by <year>
liquidity	Liquidity ratio
l.<var>	Lagged observation of <var>
manufacturing	Dummy variable; set to "1" if NACE 1.1 (10*, 15*, 17*-35*), NACE 2 (10*-32*) or NAICS (31*-33*) industry codes indicate manufacturing or if company description (in trade description English, main activity or secondary activity) contains at least one of the terms manufact*, manufact*, producti*, Producti*
operating_revenue	Operating revenue
profit	Profit/loss after tax, EUR thousand
profit_bef_tax	Profit/loss before tax, EUR thousand
margin	Profit margin (%)
return_cap_empl	Return on capital employed (%)
retail	Dummy variable; set to "1" if NACE 1.1 (52*), NACE 2 (47*) or NAICS (44*- 45*) industry codes indicate retail or if company description (in trade description English, main activity or secondary activity) contains at least one of the terms retail*, retail*, end custom*, end consum*
return	Return on shareholder funds (%)
return_assets	Return on total assets (%)
sales	Sales
Service	Dummy variable set to "1" if NACE 1.1 (25*-37*, 40*-41*, 90*), NACE 2 (33*-39*) or NAICS (54*-56*) industry codes indicates service or repair or if company description (in trade description English, main activity or secondary activity) contains at least one of the terms repair*, service*, traini*, consul*

	(to be continued)
	Table A.2. List of variables (continued)
Variable	**Definition**
sharehold_liquidity	Shareholders liquidity ratio
sharehold_fund	Shareholder funds
solvency	Solvency ratio (%)
staff_cost	Costs of employeesoyees
std3return	3-period moving standard deviation of return
std3<var>	3-period moving standard deviation of <var>
tax_corp_income	Corporate income tax rate on distributed profits (CIT)
tax_dividends	Personal income tax rate on (grossed-up) dividends (PIT)
tax_targeted	Targeted CIT (special lower rates for qualifying income) exists
tax_total	Overall PIT + CIT rate
tax_effective	Effective tax rate (%), 100*(profit_bef_tax-profit)/profit_bef_tax
wholesale	Dummy variable; set to "1" if NACE 1.1 (50*-51*), NACE 2 (45*-46*) or NAICS (42*) industry codes indicate wholesale or if company description (in trade description English, main activity or secondary activity) contains at least one of the terms Wholesal*, wholesal*, whole sal*, Whole sal*
year_incorp	Year of incorporation

Table A.3.1.a Taxation of Corporate and Capital Income 2011

Country	Central government corporate income tax rate	Adjusted central government corporate income tax rate	Sub-central government corporate income tax rate	Combined corporate income tax rate
Australia	30.0	30.0		30.0
Austria	25.0	25.0		25.0
Belgium	33.99 (33.0)	34.0		34.0
Canada	16.5	16.5	11.1	27.6
Chile	20.0	20.0		20.0
Czech Republic	19.0	19.0		19.0
Denmark	25.0	25.0		25.0
Estonia	21.0	21.0		21.0
Finland	26.0	26.0		26.0
France	34.4	34.4		34.4
Germany	15,825 (15,0)	15,825	14.4	30.2
Greece	20.0	20.0		20.0
Hungary	19.0	19.0		19.0
Iceland	20.0	20.0		20.0
Ireland	12.5	12.5		12.5
Israel	24.0	24.0	0.0	24.0
Italy	27.5	27.5		27.5
Japan	30.0	28.0	11.6	39.5
Korea	22.0	22.0	2.2	24.2
Luxembourg	22.05 (21.0)	22.1	6.8	28.8
Mexico	30.0	30.0		30.0
Netherlands	25.0	25.0		25.0
New Zealand	28.0	28.0		28.0
Norway	28.0	28.0		28.0
Poland	19.0	19.0		19.0
Portugal	25.0	25.0	1.5	26.5
Slovak Republic	19.0	19.0		19.0
Slovenia	20.0	20.0		20.0
Spain	30.0	30.0		30.0
Sweden	26.3	26.3		26.3
Switzerland	8.5	6.7	14.5	21.2
Turkey	20.0	20.0		20.0
United Kingdom	26.0	26.0		26.0
United States	35.0	32.7	6.4	39.2

Source: OECD, Table II.1. Corporate income tax rate, downloaded 24 February 2012, http://www.oecd.org/document/60/0,3746,en_2649_34533_1942460_1_1_1_1,00.html#C_CorporateCaptial

Table A.3.1.b. Taxation of Corporate and Capital Income 1985

Country	Central government corporate income tax rate	Adjusted central government corporate income tax rate	Sub-central government corporate income tax rate	Combined corporate income tax rate
Australia	46.0	46.0		46.0
Austria	55.0	55.0		55.0
Belgium	45.0	45.0		45.0
Canada	37.8 (36.0)	37.8	11.6	49.4
Czech Republic	-	-	-	-
Denmark	50.0	50.0	-	50.0
Finland	43.0	n.a.	n.a.	61.8
France	50.0	50.0		50.0
Germany	56,0	50.9	9.1	60.0
Greece	49.0	49.0		49.0
Hungary	n.a.	n.a.	n.a.	n.a.
Iceland	n.a.	n.a.	n.a.	n.a.
Ireland	50.0	50.0		50.0
Italy	52,2 (36)	46.4		46.4
Japan	43.3	n.a.	5.0 / 12.3 / 12.0	n.a.
Korea	n.a.	n.a.	n.a.	n.a.
Luxembourg	(40.0)	n.a.	n.a.	n.a.
Mexico	42.0	42.0		42.0
Netherlands	43.0	43.0		43.0
New Zealand	45.0	45.0		45.0
Norway	29.8	29.8	21.0	50.8
Poland	n.a.	n.a.	n.a.	n.a.
Portugal	51.60 (45.00)	51.12 (45.00)	4.0	55.12
Slovak Republic	-	-	-	-
Spain	35.0	35.0		35.0
Sweden	52.0	52.0	-	56.6
Switzerland	9.8	6.677	25.19	31.866
Turkey	n.a.	n.a.	n.a.	n.a.
United Kingdom	40.0	40.0		40.0
United States	46.0	42.8	7.0	49.8

Source: OECD, Table II.1. Corporate income tax rate, downloaded 24 February 2012, http://www.oecd.org/document/60/0,3746,en_2649_34533_1942460_1_1_1_1,00.html#C_CorporateCaptial

Table A.3.2. Overall tax rate on distributed profits: tax rate changes by country 1985-2011

Country	Tax decreases	Tax increases
Austria	1	0
Belgium	2	0
Czech Republic	11	0
Denmark	2	1
Estonia	4	0
Finland	0	2
France	8	4
Germany	0	1
Greece	3	1
Hungary	2	4
Ireland	9	2
Italy	5	3
Luxembourg	3	0
Netherlands	5	1
Norway	3	2
Poland	3	0
Portugal	3	0
Slovenia	4	1
Spain	5	1
Sweden	3	0
Switzerland	9	0
United Kingdom	3	3
Sum	88	26

Source: OECD Overall statutory tax rates on dividend income , downloaded 24 February 2012, http://www.oecd.org/document/60/0,3746,en_2649_34533_1942460_1_1_1_1,00.html#C_CorporateCaptial, and authors calculations.

Table A.3.3. Summary statistics (selected variables)

Variable	Obs	Mean	Std. Dev.	Min	Max
active	1363158	.8151322	.3881904	0	1
added_value	973441	9002240	2.87e+07	-5.18e+08	9.94e+08
assets	1362858	3.19e+07	9.21e+07	-2631842	1.00e+09
Belgium	1363158	.0533291	.224689	0	1
cash_flow	1149993	3169230	1.28e+07	-4.26e+08	9.76e+08
tax_targeted	1363148	.6179659	.485885	0	1
tax_corp_income	1249289	31.57176	5.156022	12.5	60.1
consol_1	1363158	.03409	.1814603	0	1
consol_2	1363158	.059514	.2365843	0	1
consol_4	1363158	.8617915	.3451188	0	1
consol_5	1363158	.0446016	.2064275	0	1
curr	1328172	2.620336	6.941465	0	99.98
employees	1009079	281.2701	3349.529	0	1893091
France	1363158	.1730746	.3783119	0	1
Germany	1363158	.082771	.2755359	0	1
IFO_eur	1362403	88.78034	14.40186	57.83898	116.5254
independence	1363158	.1767271	.3814378	0	1
interest_paid	1163553	452751.2	2467879	-2.42e+07	8.01e+08
Italy	1363158	.1823164	.3861052	0	1
liquidity	1311422	2.178741	6.70824	0	99.98
nacpri	1138032	4661.635	1973.946	100	9900
naicor	1138032	4229.729	1257.873	1100	9281
Netherlands	1363158	.0412315	.1988252	0	1
Norway	1363158	.0410327	.1983659	0	1
manufacturing	1363158	.2155796	.4112239	0	1
profit	1333126	2244698	1.26e+07	-3.77e+08	8.87e+08
profit_bef_tax	1363158	2778379	1.39e+07	1	8.87e+08
Poland	1363158	.0441563	.2054423	0	1
margin	1243617	8.212753	13.26387	0	100
return_cap_employees	1140735	29.12828	44.4509	-112.32	1000
retail	1363158	.0566545	.2311813	0	1
return	1363158	38.57373	64.9938	.01	1000
return_assets	1362851	9.275726	11.0921	-7.52	100
services	1363158	.2865258	.4521382	0	1
sharehold_fund	1363158	1.38e+07	5.28e+07	1	9.96e+08
sharehold_liquidity	1141194	50.60817	364.6084	0	10000
solvency	1362853	37.16301	26.04185	0	100
Spain	1363158	.158815	.3655037	0	1
staff_cost	1160365	5347024	2.05e+07	-2.61e+08	9.62e+08
std3return	762017	15.25405	29.60213	0	572.8825
Sweden	1363158	.041957	.200491	0	1
tax_dividends	1249289	31.49136	16.28147	0	72.8
tax_total	1249289	47.28863	8.19538	21	89.1

				(to be continued)	
	Table A.3.3. Summary statistics (selected variables) (continued)				
Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
tax_effective	1333126	.4434162	17.8537	-3715	16513
UK	1363158	.0605447	.2384934	0	1
wholesale	1363158	.188824	.3913689	0	1
year_incorp	1142581	1984.052	19.01302	1851	2010
2000	1363158	.0684785	.2525653	0	1
2001	1363158	.0753625	.2639755	0	1
2002	1363158	.0818651	.2741591	0	1
2003	1363158	.0888789	.284569	0	1
2004	1363158	.1006545	.3008708	0	1
2005	1363158	.1150358	.3190653	0	1
2006	1363158	.1275017	.3335343	0	1
2007	1363158	.1306048	.3369678	0	1
2008	1363158	.1158098	.3199968	0	1
2009	1363158	.0459785	.2094386	0	1