THE EFFECTS OF TAX COMPETITION ON FOREIGN DIRECT INVESTMENTS IN THE ENLARGED EUROPEAN UNION

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The issue of tax competition has fuelled a lot of interest and debates among theoreticians as well as practitioners during the last decades. The intense financial and labour flows due to globalisation has led to a "race to the bottom" tax competition among countries, some theoreticians considering it as beneficial others, on the contrary, blaming it as harmful competition, encouraging misallocation of resources.The paper endeavours to find out whether the tax competition has indeed a significant influence on the foreign direct investments flow, or other determinants are equally or more important in this process.This paper provides an empirical analysis of the impact of corporate tax rates on FDI. We use a panel of bilateral FDI flows for European Union member countries over the period 1995-2006.

Keywords: tax competition, foreign direct investment, statutory tax rates, effective tax rates

JEL classification: F21, H25, H87

1. The empirical literature on the effects of taxes on FDI

The tax competition literature has long been stating that increasing international integration might impose a growing pressure on tax policies, as raising taxes creates an incentive for mobile tax payers to relocate abroad. Because tax base relocation is proportionally more important in small countries than in large ones, this literature further shows that small countries have stronger incentives than large ones to cut taxes, which could eventually lead tax rates on mobile income converge toward zero. This theoretical conclusion has given rise to a number of papers dealing with tax competition, which emphasize, both on the theoretical and empirical level, that tax competition is unlikely to lead to zero taxation. On the theoretical level, the literature has highlighted the impact of various factors that impede the convergence of tax rates to zero: when taxation allows for the provision of public goods, tax rates can be higher (Tiebout, 1956); tax differentials are second-order determinants compared to the proximity to final markets or the characteristics of competition on the labor and goods markets for instance (Markusen, 1995); tax differentials can be an equilibrium outcome in an imperfect competition setting combining economies of scale with trade costs and/or agglomeration forces (Baldwin & Krugman, 2004).

As far as corporate taxation is concerned, most existing empirical studies focus on one particular aspect of tax competition, which is the sensitiveness of foreign direct investment or firms location decision to taxation. These show that MNEs do react to tax incentives, be they embedded in tax rules (which avoid double taxation problems through credit or exemption schemes) or tax rates (Gordon & Hines, 2002).

The empirical literature on the effects of taxes on FDI focuses almost exclusively on the US and the EU-15 data. There are only a few studies on FDI determinants in the NMS and only one of them applies effective taxation. Carstensen and Toubal (2004) apply difference between statutory rates of two countries as variable determining FDI flows for the sample of 1993-1999 and CEECs and conclude that estimated parameter value is small and not significant at the 5% level. The potential explanation was that they did not take into account special tax regimes designed to attract FDI. Application of effective tax rates would address these shortcomings. Tax rates were also examined as FDI determinant by Edmiston et al. (2003) who apply two variables: number of special tax rates and the highest statutory profit tax rate. The results indicate that imposition of an additional special tax rate reduces FDI as a percent of GDP and higher tax rates lead to lower inflows of FDI in FSU and CEECs. Again, the variable applied is statutory rate.

Most of the earlier studies, mainly using statutory tax rates, suggest an inelastic response of FDI to the corporate income tax burden. As statutory tax rates are an inferior measure of the corporate income tax burden, Bellak and Leibrecht (2005) provide the first empirical application of effective average tax rates (beatrs) on the bilateral level to explaining FDI flows to the CEEC-8. Their analysis is based on the OLI-paradigm, which explains the choice for FDI versus other routes of foreign market servicing, and a panel-gravity setting. They find that FDI is positively related to both source and host-market size as well as to progress in privatisation and that FDI is inversely related to the distance between home and host countries as well as to the effective corporate income tax burden and to unit labour costs. The derived tax-elasticity is very robust and higher than those derived in earlier studies on CEECs, pointing to a larger importance of tax policy for company location decisions. The coefficient on the beatr is always statistically significant and negative in the range of –3.3 and -4.6. Results also suggest that the relative importance of the beatr as a determinant of FDI must not be over-emphasised as the results reveal that at least during the period 1995-2003 the beatr had no exceptional influence on FDI flows in the CEEC-8 as compared to other determinants.

Lahreche-Revil (2006) adds data on some of the current new members to their EU15 sample, and tries to separate the effects of corporate taxation in the new members for the sample 1990-2002. The analysis is run on *bilateral* FDI data, which allows to identify the impact of tax incentives more accurately, since tax incentives can be computed for each pair of investing/recipient country. Tax measure determines the sample: statutory rate, implicit tax rates and effective average tax rates (EATR). The empirical investigation relies on a gravitational setting for FDI. FDI flowing from EU15 countries to the EU15 and the NMS is explained by the size of the investor, the market potential of the host, the distance between both country and additional gravity variables (contiguity, common language). Only implicit taxation can be shown to be a significant tax determinant of FDI flows, while statutory and *ex-ante* taxation fail to significantly explain location decisions. As to tax differentials, when significant, they also only affect investment decision when the investor targets an EU15 country, with a potential non-linear impact. Taking into account competition between potential host countries for attracting FDI confirms that tax incentives are ignificantly affecting FDI decisions only within the EU15 countries of the sample: on the whole sample, higher taxes in alternative potential locations tend to increase FDI in a given country, but this proves to be the result of the sensitivity of FDI flows going the EU15 only, since FDI flowing to the NMS is not affected by tax changes in other potential locations.

The issue of tax competition is examined with the use of the gravity model and of Jakubiak and Markiewicz (2007). The estimation of basic equation suggests that "traditional" gravity variables and differences in statutory tax rates have directed FDI flows to and from NMS. It suggests that investors – apart from the economic potential and distance – look at the nominal taxation when deciding about moving capital to and from the region. On the other hand, it is a bit surprising that differences in effective taxation do not seem to matter. Perhaps the backward looking measure is the reason for that. Ordinary differences in tax rates – be it positive or negative – do not seem to determine FDI flows. FDI remain determined by the economic potential of OMS, the economic potential of a destination country and the relative closeness that encourages FDI flows. However, the picture changes when distinguish for the economic potential of "big" vs. "small" country, which generates FDI. On the top of it, statutory and effective corporate tax rates matter, although in an asymmetric way If investors can pay lower taxes at home than in a destination country, it hampers FDI flows to such destinations. For effective taxation, the result is especially strong if flows originate in a NMS.

2. Evidence concerning the effects of tax competition on foreign direct investments

The subject of tax competition can be examined using the gravitational model according to which the bilateral flows among origin and host countries are reduced on the basis of FDI flows, gravitational variables and taxes.

2.1 The gravity model

The regression equation is the following:

$$\log(FDI_{ijt}) = \alpha + \beta_1(CLI_{ijt}) + \beta_2(CEI_{ijt}) + \beta_3\log(GDP_{jt}) + \beta_4\log(GDP_{it}) + \beta_5\log(DIST_{ij}) + \beta_6 FC_{ij} + \beta_7(CUFM_{ijt}) + \beta_8\log(CPI_{jt}) + \varepsilon_{ijt} \quad (1)$$

where FDIijt are the foreign direct investment flows among two countries (i country of origin, j host country) during a t interval. While estimating bilateral investment flows, we considered FDI outward flows financed with equity and other capital. As "other" flows consist mainly of loans and repayments from/to mother companies and subsidiaries, there is a possibility of obtaining negative flows (when repayments are large and larger than loans and equity inflows). This means that some observations have to be excluded, because they cannot be logarithmically transformed. In our sample, this approach resulted in the exclusion of 8% of observations on FDI flows. The study covers 27 EU member states during 1995- 2006 annual time series expressed in millions of Euro: 2575 observations are positive, 678 are negative and 5170 are zero or unavailable. Data on FDIs were taken from EUROSTAT.

The tax variables, traditional gravity variables and traditional FDI determinants

The tax variables of our interest that can potentially influence capital flows are the statutory tax rates *(CLI_{ijt})* and effective tax rates *(CEI_{ijt})*. CLI_{ijt} are the ratios between the statutory tax rates between the source (*i*) and the destination country (*j*). CEI_{ijt} are the similarly computed differences in effective tax rates. The effective tax rates were calculated for the whole sample with macro-backward approach.

Traditional gravity variables measuring distance from capital cities between the sending and receiving countries ($DIST_{ij}$) and the existence of common border (FC_{ij}) were also included. The variable FC_{ij} is a dummy that takes the value of 1 if there exists a common border, and 0 otherwise.

Thus, we decided to include market size variable, as the one that motivates FDI (GDP_{jt}), measures the size of the destination country. As these are bilateral flows that are considered, a variable measuring the size and the economic potential of the sending country was also included (GDP_{it}). We also included – public capital expenditures in percent of GDP, in the host country (CPI_{jt}). The resource-seeking motive and the empirical works on FDI determinants suggest that low cost labour should also influence aggregate investment flows. Hence, we included labour cost variable in our model, measuring also the relative abundance of labour in each of the host countries vis-à-vis the home countries. $CUFM_{ijt}$ are the ratios of unit labour costs that are supposed to capture the resource-seeking FDI motive.

The results are shown in Table nr.1, showing that the considered variables have a significant effect n FDI flows for the EU27 member states. The GDP influence is a positive one even when cost variables are considered in the equation. Statutory tax rates have a positive impact in most cases, FDI flows being directed towards countries with lower statutory tax rates, while the impact of effective tax rates, though positively influencing the FDI, flows have a weaker influence. In addition, the labour costs positively influence FDI flows, countries with lower costs being attractive for FDIs. Likewise, countries with higher infrastructure public spending in the host country encourage FDI flows.

Table nr. 1 The effects of gravitational variables, taxation, labour cost and infrastructure public spending on FDI flows

Dependent Variable: LOG(FDIIJT?)
Method: Pooled Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.736694	0.831371	-9.305946	0.0000
CLIIJT?	0.458586	0.122447	3.745180	0.0002
CEIIJT?	0.024945	0.037292	0.668903	0.5036
LOG(GDPIT?)	0.859465	0.032415	26.51446	0.0000
LOG(GDPJT?)	0.783547	0.033371	23.47967	0.0000
CUFMIJT?	0.327655	0.394010	0.831592	0.4057
LOG(CPIJT?)	0.501276	0.119269	4.202905	0.0000
LOG(DISTIJ?)	-1.405745	0.077435	-18.15391	0.0000
FCIJ?	-0.218306	0.136183	-1.603031	0.1091

R-squared	0.463471	Mean dependent var	4.274123
Adjusted R-squared	0.461538	S.D. dependent var	2.627942
S.E. of regression	1.928384	Akaike info criterion	4.155271
Sum squared resid	8255.433	Schwarz criterion	4.178323
Log likelihood	-4622.049	F-statistic	239.7134
Durbin-Watson stat	1.305602	Prob(F-statistic)	0.000000

2.2 Separating the effects among EU15 and NMS12 according to geographical location

Because the high heterogeneity among NMS12 and EU15 countries one can presume that determinants like tax rates and cost variables may differ significantly. In order to analyze this aspect the estimated coefficients are differentiated according to geographical location of host countries. The impact of taxation and labour costs on FDI flows is differentiated according to host country location (i.e. belong to the EU15 or NMS12 sample). Therefore, the taxation variables and labour cost ones interact with a *dummy variable* EU_i equaling 1 when the host country belongs to EU15 sample and zero $(1\text{-}EU_i)$ when belongs to NMS12 sample. The taxation coefficient and the labour costs interact with EU_j for EU15 group and $(1\text{-}EU_j)$ for NMS12 describing the geographical location of the host country. The regression equation is:

$$\log(FDI_{ijt}) = \alpha + \beta_1 EU_j * CLI_{ijt} + \beta_2(1- EU_j) * CLI_{ijt} + \beta_3 EU_j * CEI_{ijt} + \beta_4(1\text{-}EU_j) * CEI_{ijt} + \beta_5\log(GDP_{jt}) + \beta_6\log(GDP_{it}) + \beta_7\log(DIST_{ij}) + \beta_8 FC_{ij} + \beta_9(CUFM_{ijt}) * EU_j + \beta_{10}(CUFM_{ijt}) * (1- EU_j) + \beta_{11}\log(CPI_{jt}) + \varepsilon_{ijt} \quad (2)$$

The estimated coefficients for the gravitation variables are resistant when EU_j dummy interactive variables are included. In case of separating the effects on taxation variables and labour costs an asymmetric behaviour can be noticed for NMS12 countries as compared to the EU15 ones. When they become significant, the statutory taxation differentials affect FDIs flowing towards the EU15 countries (positive value), but not towards the NMS12 countries (negative value).

The asymmetry among NMS12 and EU12 countries is also noticed in computations concerning the labour cost differentials. Obviously, the labour costs in NMS12 countries (presumably smaller) has a positive and significant impact on the FDI towards these countries while rather smaller in EU15 countries. The investment public spending in the host country also encourages the FDI flows.

2.3 Separating the positive and negative effects of tax rates differentials

The previous estimation relied on the hypothesis of a symmetric positive and negative effect of tax rates differentials. But, actually the impact can be highly asymmetric, the main reason being the coexistence of different double taxation schemes in investing countries. In order to identify the existence of such asymmetries influencing the effects of taxation and of labour costs, dummy variables are considered to reveal the sign of the taxation differentials: POZ_{ijt} equals 1 when the taxation differential is positive (the country of origin has higher tax rates than the host one) and NEG_{ijt} ($NEG_{ijt} = 1 - POZ_{ijt}$) equals 1 when the tax differential is negative (the country of origin has lower tax rates than the host one). Next, the $EU_{j,}$ variable is added to determine whether there is another asymmetry induced by the geographical situation of the host country, i.e. the separation of positive and negative effects on EU15 and NMS12 host countries. In separating the positive and negative effects of statutory and effective tax rates, the following regression equation is used:

$$\log(FDI_{ijt}) = \alpha + \beta_1 POZ_{ijt} * CLI_{ijt} + \beta_2 NEG_{ijt} * CLI_{ijt} + \beta_3 POZ_{ijt} * CEI_{ijt} + \beta_4 NEG_{ijt} * CEI_{ijt} + \beta_5 \log(GDP_{jt}) + \beta_6 \log(GDP_{it}) + \beta_7 \log(DIST_{ij}) + \beta_8 FC_{ij} + \beta_9 (CUFM_{ijt}) + \beta_{10} \log(CPI_{jt}) + \varepsilon_{ijt} \quad (3)$$

The results shown in Table nr.2 reveal the fact that the investment flows are positively influenced towards countries with lower statutory rates compared to the countries of origin ($POZCLI_{ijt}$ has a positive value), and not at all influenced ($NEGCLI_{ij)}$ is negative) when the host country has high tax rates that the country of origine. When the variables are negative the investment flows are not influenced. Gravitation variables GDP_{it} and GDP_{jt} have positive signs and significant values, the labour costs themselves positively influencing the investments.

Table nr. 2 Separating the positive and negative effects of taxation differentials

Dependent Variable: LOG(ISDIJT?)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.201295	0.832396	-8.651281	0.0000
POZCLIIJT?*CLIIJT?	0.143486	0.113967	1.259006	0.2082
NEGCLIIJT?*CLIIJT?	-0.002831	0.194095	-0.014586	0.9884
POZCEIIJT?*CEIIJT?	-0.037172	0.040356	-0.921101	0.3571
NEGCEIIJT?*CEIIJT?	-0.559462	0.141353	-3.957915	0.0001
LOG(GDPIT?)	0.877948	0.032728	26.82572	0.0000
LOG(GDPJT?)	0.770109	0.034056	22.61330	0.0000
CUFMIJT?	0.338385	0.395619	0.855332	0.3925
LOG(CPIJT?)	0.550850	0.119769	4.599270	0.0000
LOG(DISTIJ?)	-1.404580	0.077277	-18.17586	0.0000
FCIJ?	-0.231846	0.135951	-1.705365	0.0883

R-squared	0.466516	Mean dependent var	4.274123
Adjusted R-squared	0.464111	S.D. dependent var	2.627942
S.E. of regression	1.923771	Akaike info criterion	4.151374

Sum squared resid	8208.582	Schwarz criterion	4.179549
Log likelihood	-4615.706	F-statistic	193.9575
Durbin-Watson stat	1.329413	Prob(F-statistic)	0.000000

3. Conclusions

At the beginning of the transition process, the Central and Eastern European countries engaged in a full speed capital account opening leading to intense FDI inflows. This process was accompanied by important reforms in the taxation area generally following a decrease of tax rates and the tax base broadening. This behaviour raised suspicions that these countries engaged in a race to the bottom process forcing other countries to lower their corporate tax rates.

Recent studies suggest that the gravitation equation represents a a critical tool to investigate the determinants of FDI flows. It also allows bilateral analyses encouraging considering the effects of the taxation stimulus packages on the investment location decisions. In our endeavour the bilateral flows among the 27 EU countries is explained by using the gravitational variables (the dimension of the investor, the market potential of the host country, and the distance between countries having a mutual border. These are structural determinants on the FDI flows in the sense that their unconditional impact on the host region. In these circumstances the taxation appears as a determinant but of non uniform importance for the FDI flows.

When the standard gravitational effect is used the estimations show that the statutory tax rates are important determinants in attracting FDIs while the effective tax rates are not relevant in location decision. The EU27 sample is heterogeneous concerning the attraction determinants on FDI flows. Indeed, the authors show that the effects of taxation and of labour cost depend on the destination of the FDI flows (EU15 or NMS12). It is also shown how the labour costs impact positively on the FDI, the lower the labour costs the more intense FDI flows (the results are significant for the NMS12 countries). The tax differentials become important when the investor envisages locating the plant in EU15 countries. For the whole EU27 countries only the statutory tax rates impact when they are lower in host countries, while when separating the effects of taxation for the two groups this determinant is significant in the EU15 countries while for the NMS12 it is insignificant.

To conclude: "who is afraid of taxation"?. At first sight the EU old member states are worried because the lowering of tax rates in the NMS. But, as reassurance, the lowering of tax rates do not significantly impact on the FDI flows in the NMS but only in the EU15 countries. Therefore the competition coming from the NMS is not harmful.

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